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BRAUNERIA ATRORUBENS AND B. PARADOXA

ERNEST J. PALMER

WHILE looking over a collection of plants made by Mr. George M. Merrill in the Platt National Park, Murray County, Oklahoma, I came across several specimens of a *Brauneria* which I did not at once recognize. Upon consulting the second edition of Small's *Flora of the Southeastern United States* they proved to be *Brauneria atrorubens* (Nutt.) Boynton & Beadle,¹ as treated in that work. The Oklahoma plants looked surprisingly like *Brauneria paradoxa*, of the Ozark glades, except for the color of the rays, which was purple or purplish-pink, while that of the Ozark plant wherever I have seen it has been a deep clear yellow. In Small's description it is stated that the rays of *Brauneria atrorubens* are either purple or yellow, and the range is given as Missouri and Arkansas. Since there is no other species in that region that would at all answer the description, it seems evident that it was the intention of the author to include *Brauneria paradoxa* under the older name and to broaden the description to cover both, although no synonymy is given.

The identity of Nuttall's plant, presumably collected on his journey to the Arkansas Territory in 1819, and which he first described as *Rudbeckia atrorubens*,² and afterwards transferred to the genus *Echinacea*,³ was later confused by the treatment in Gray's *Synoptical Flora* and in Chapman's *Flora of the Southern United States*, as pointed out by Boynton and Beadle.

¹ Biltmore Bot. Studies 1: 11-12. 1901.

² Journ. Acad. Nat. Sci. Phila. 7: 80. 1834.

³ Trans. Am. Phil. Soc. n. s. 7: 354. 1841.

My interest in working out the identity of the Oklahoma plants and their relationship to the yellow-rayed plant of the Ozarks led me to write to the Academy of Natural Sciences of Philadelphia, where Nuttall's type specimen is deposited, and through the kindness of Dr. Pennell, the curator, I was able to borrow it for examination.

In its present condition the Nuttall specimen consists of a stem about 7 dm. high, with part of the fusiform root, several leaves, and the head, of which only the involucre and disk remain, the rays being entirely gone. The stem is striate and glabrous except near the summit where it is roughened with short scabrous ciliae. The leaves are lanceolate or linear-lanceolate, 3-ribbed, glabrous, except for ciliate margins, with blades 6-8 cm. long and scarcely 1 cm. wide, and slender petioles 4-5 cm. long on the basal ones, and shorter above.

The plants collected by Mr. Merrill, numbers 327 (May 7), 443 (May 17), and 819 (July 2), 1935, match very closely the Nuttall plant, except that some of them are more robust, the tallest being 8 dm. high, and the leaves slightly larger and sometimes scabrate on the lower surface. Some of the basal leaves have blades 10-12 cm. long and petioles almost as long. The greatest width of the blades of the middle stem leaves is about 14 mm., and there is sometimes a slight development of a second pair of lateral veins on these.

Brauneria paradoxa as shown by specimens in the Gray Herbarium, and as I have observed it many times growing in the Ozark region, closely resembles Nuttall's plant and the specimens collected in Oklahoma in its vegetative characters. The two plants seem, however, to be segregated geographically and ecologically, and to differ constantly in the color of the rays and perhaps in other minor particulars. Judging by Nuttall's plant and the material from Oklahoma, the leaves of *Brauneria atrorubens* are always linear-lanceolate, 8-14 mm. wide, 3-ribbed or rarely with traces of an additional pair, while in *Brauneria paradoxa* the blades of the middle stem-leaves are sometimes as much as 3.5 cm. wide, and with somewhat shorter petioles and 5 distinct ribs. In the Oklahoma specimens referred to *Brauneria atrorubens* the rays are sometimes 4-6 cm. long and distinctly pendulous, while in *Brauneria paradoxa* they are seldom over 3-4 cm. long and are spreading or reflexed, though becoming pendulous as they wither.

Brauneria atrorubens (Nutt.) Boynton & Beadle is evidently a valid name and represents a good species, but without more material

it is difficult to say whether *Brauneria paradoxa* Norton should be regarded as a distinct species or only as a variety of the former. If the latter view is taken it will afford a good opportunity for someone to make a new combination. For the present it seems to the writer safer to maintain both species. More information is also needed to determine the range of the two plants. The label on the type specimen in the herbarium of the Philadelphia Academy of Natural Sciences bears the notation in Nuttall's handwriting: "R. atrorubens. * Ark. Same from N. Carol. Nutt." The asterisk was the author's indication that he considered it a new species. After the published description of *Rudbeckia atrorubens* the habitat or range is given as: "In the plains of Arkansas, and also Georgia, from whence I have received roots from my indefatigable friend, Dr. W. J. Wray." But no material of this species has turned up from the Southeastern States in recent years so far as I can discover, nor is it credited to that region in Small's Flora or in other recent treatments.

In the original description of *Brauneria paradoxa* the author cites a specimen collected by Lindheimer in Texas, but I have never seen it outside of the Ozark region, where it is restricted to glades, usually on magnesian limestone, and where unusual ecological conditions prevail.

This note is written in the hope of eliciting further information about both of the plants under discussion.

ARNOLD ARBORETUM.

A NEW IRIS FROM CALIFORNIA

ROBERT C. FOSTER

IN the unidentified material of *Iris* in the Gray Herbarium two sheets of the same species have been found, belonging to the section *Apogon*, subsection *Californicae*. Upon comparison with the types of several species of this group and characteristic material of the remaining members, differences are apparent, so distinct as to warrant the addition of a new species to the subsection.

IRIS Thompsonii, spec. nov., planta caespitosa; rhizoma gracilis, plus minusve 1 cm. diametro, vadosa crescente; folia pauca, linearia, acuta, ad 30-35 cm. longe, caule excedentia, 3-5 mm. lata, nervis prominentibus, subglaucescentia; caulis simplex, 10-25 cm. altus, 2-3 foliis angustatis, reductis, $\frac{1}{2}$ - $\frac{2}{3}$ liberis, ornatus; spathae valvae

parum inaequilongae, 1-2-fl., subcarinatae, anguste lanceolatae, herbaceae, $3\frac{1}{2}$ -5 cm. longae, 6-9 mm. latae; pedicelli plus minusve 12 mm. longi, primus quam secundus brevior; ovarium 1-2 cm. longum, ad basim apicemque aequae fastigatum, gradatim in tubum praeteriens; perianthii tubus linearis, plus minusve 13 mm. longus; perianthii segmenta exteriora oblanceolato-spathulata, lamina in unguem gradatim attenuata, apice obtuse rotundata, coeruleo-purpurea, 35-38 mm. longa, 10-13 mm. lata; segmenta interiora angustiora, oblanceolato-spathulata, apice obtusa, 32-38 mm. longa, plus minusve 7 mm. lata; styli rami 2 cm. longi; cristae quam styli rami breviores, subquadrato-triangularae, non lineares, distincte crenatae, 7-10 mm. longae; stigma triangulare, acutum; filamenta circa 8 mm. longa, antheris aequilongis; capsula immatura, sed 25 mm. longa, abrupte ad rostratam fastigata; semina non visa. Northwest California and southwest Oregon. CALIFORNIA: Del Norte Co.: Douglas Park, semi-open slopes $\frac{1}{2}$ mile from the Smith River, about 500 ft. alt., June 5-7, 1928, *J. W. Thompson*, no. 4510 (TYPE, in Gray Herb.). OREGON: Curry Co.: summit of Pistol River Mtn., June 5, 1928, *J. W. Thompson*, no. 4547a.

This distinct and charming little species I am happy to name for its discoverer, Mr. J. W. Thompson, of Seattle, Washington, who has been kind enough to permit me to see additional material of it, and to send me notes upon its habitat. According to him, it is a "handsome, deep blue species, densely cespitose," found in a region "on the edge of the coast redwoods, *Sequoia sempervirens*." Closely associated with it are *Arctostaphylos*, and *Pyrola dentata*. In addition to the type in the Gray Herbarium, sheets have been seen from the United States National Herbarium, the Herbarium of the Missouri Botanical Garden, and the herbarium of the collector, Mr. Thompson. These may be designated as co-types.

It is unlikely that *I. Thompsonii* will be confused with any other member of the *Californicae*, except, perhaps, its nearest relative, *I. innominata* Henderson, from which it differs in the following respects: shorter perianth-tube, more narrowly lanceolate spathes, cauline leaves free for a greater portion of their length, perianth-segments smaller, slighter, more nearly spatulate, and filaments and anthers equal in length. From typical *I. macrosiphon* Torr., it differs in having longer stems, with longer and narrower cauline leaves, narrower and less glaucous leaves, much shorter and broader spathe-valves, shorter perianth-tube (about one-third the length of the other), smaller flowers, shorter style-branches, and larger style-crests.



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Photo. E. C. Ogden

SOLIDAGO MULTIRADIATA: FIG. 1, plant, $\times 1$, from Labrador. S. MULTIRADIATA, var. PARVICEPS: FIG. 2, TYPE, $\times 1$.

With the type specimen I have associated *Thompson*, no. 4547a from southwestern Oregon, not far north of the type locality. Although it appears to be an alpine ecotype of *I. Thompsonii*, certainty is impossible since the single flower is poorly preserved. In most respects it seems to be a miniature version of the typical form, with the spathes somewhat narrower in proportion to their length, but such differences as exist do not justify giving it separate status as a form, particularly on the basis of a single specimen.

GRAY HERBARIUM,
HARVARD UNIVERSITY.

CONTRIBUTIONS FROM THE GRAY HERBARIUM OF HARVARD UNIVERSITY—NO. CXIII.

M. L. FERNALD

(Continued from page 182)

VI. STUDIES IN *SOLIDAGO*

SOLIDAGO PETIOLARIS Ait. The late K. K. Mackenzie substituted for *S. petiolaris* the name *S. Milleriana* Mackenz. in Small, Man. 1350, 1503 (1933), on the first cited page giving in marks of quotation as a synonym of his new name "*S. petiolaris* Ait.", on p. 1503 "*Solidago Milleriana* Mackenzie. *Solidago petiolaris* Authors, not Ait." The inference is clear that Mackenzie thought that *S. petiolaris* Ait. has been misidentified by American authors. Aiton's species had been received at Kew from Philip Miller; consequently, if the plant which has passed regularly as Aiton's *S. petiolaris* is not what Aiton had from Miller, it seems a somewhat tangled philosophy which produces for it the name *S. Milleriana*. I do not know Mackenzie's reason for supposing that his *S. Milleriana* is not *S. petiolaris* Ait. The characterization of the latter was brief and clear:

S. caule erecto villosa, foliis ellipticis scabriusculis petiolatis, racemis erectis elongatis.

Mackenzie's *S. Milleriana* has

Stem . . . strict, closely short-hispid above, . . . : leaf-blades oblong-oval, . . . scabrous-hispidulous above, sparsely pubescent beneath . . . : heads 7-8 mm. high; involucre bracts lanceolate, acute, appressed-pubescent, all except the inner with spreading tips.

Aiton did not describe the involucre; but portions of Aiton's type, presented to Asa Gray in 1881 and now preserved in the Gray Herbarium, show the very distinctive heads with lance-attenuate, pubescent bracts, and the oblong or elliptic, entire leaves with scabrous upper surface, minutely pilose lower surface and scabrous-ciliolate margins exactly as in *S. Milleriana*. In brief, *S. petiolaris* Ait., as shown by the original material, was well described by its author and is exactly the plant correctly called *S. petiolaris* by Gray in the Synoptical Flora. It is identical with *S. Milleriana* Mackenzie and the latter name is a synonym which might well have been avoided.

SOLIDAGO MULTIRADIATA Ait., var. **parviceps**, var. nov. (TAB. 417, FIG. 2), forma typica recedit involucre parvo 3-4(-5) mm. longo bracteis circa 15.—QUEBEC: damp calareous cliff, "Monts Appalaches, near Cape Rosier, Gaspé Co., July 9, 1931, G. L. Stebbins, jr. (TYPE in Gray Herb.)

Typical *Solidago multiradiata* (FIG. 1) which abounds on the Labrador Peninsula, in northeastern, northern and western Newfoundland and on the outer coast and the higher mountains of the Gaspé Peninsula, reaching its southern limit on St. Paul Island, Nova Scotia (Perry & Roscoe, no. 382), varies in stature from dwarfs of scarcely measurable height to luxuriant clumps 4.5 dm. high; but, whether dwarf or gigantic (for the species) the involucres remain large (5-7 mm. long) with 20-30 bracts. Var. *parviceps*, a local plant of Gaspé, reaches its most extreme development (FIG. 2) on the cliffs of the "Monts Appalaches" (the hills between Grand Grève and Cape Rosier) but essentially identical specimens, mixed with more typical *S. multiradiata*, were collected on Mt. Albert by Victorin, Rolland, Brunel & Rousseau in 1923 (no. 17,585) and transitional material had been secured on Mt. Albert in 1881 by John A. Allen, and in 1906 by Fernald & Collins (no. 753). This transitional series indicates that var. *parviceps* is a variety rather than a distinct species.

SOLIDAGO DECUMBENS Greene, var. **oreophila** (Rydb.), comb. nov. *S. oreophila* Rydb. Mem. N. Y. Bot. Gard. 1. 387 (1900).

Solidago oreophila was not described by Rydberg, when he published it, but it is here interpreted as the common extreme of *S. decumbens* growing in the Rocky Mountains lower down than the typical *S. decumbens*. The latter has few heads in a subcorymbiform thyrse and is the alpine extreme of the wide-ranging species, found from 9,000-13,100 feet (2750-4000 m.), on the mountains from Wyoming to New Mexico. At lower levels it passes insensibly into the taller



Photo. E. C. Ogden

SOLIDAGO DEAMII: FIG. 1, TYPE, $\times 5/12$; FIG. 2, head from TYPE, $\times 5$; FIG. 3, disk-floret from TYPE, $\times 5$.

S. RANDII: FIG. 4, head, $\times 5$, from Maine; FIGS. 5 and 6, florets, $\times 5$, from same specimen.

S. RACEMOSA, var. *GILLMANII*: FIG. 7, rosette-leaf from the original Gillman material, $\times 5/12$.



Photo. E. C. Ogden

SOLIDAGO SIMULANS: FIG. 1, TYPE, $\times 2\frac{2}{3}$; FIG. 2, involucre of TYPE, $\times 5$; FIG. 3, disk-flower from TYPE, $\times 5$; FIG. 4, disk-corolla, with 2 lobes laid back, $\times 5$; FIG. 5, achene from TYPE, $\times 10$.

S. ULIGINOSA: FIG. 6, involucre, $\times 5$, from Quebec; FIG. 7, disk-corolla, $\times 5$, from same specimen; FIG. 8, achene, $\times 10$, from same specimen.

S. AUSTRINA: FIG. 9, involucre, $\times 5$, from North Carolina.

var. *oreophila* which has a longer, more racemiform thyrses, with the heads tending to be slightly smaller. In the States from New Mexico to Wyoming (the area where the alpine typical *S. decumbens* occurs) var. *oreophila* extends from subalpine areas into the timber ("in timber," "pine woods," "dry pine ridge," "subalpine slopes," "dry hillsides," etc.), its altitudinal range given on the labels as 6560–10,000 feet (2000–3050 m.). Many sheets, such as *Clokey* nos. 2895 and 3896 and *Clements* no. 300, show embarrassingly transitional series and such a sheet as *C. F. Baker's* no. 718, with the elongate thyrses and small heads of var. *oreophila* was identified by Greene as his *S. decumbens*; and the names have been very frequently reversed by those who should rightly apply them if the series can be resolved into two real species. North of Wyoming var. *oreophila* comes down to much lower levels, extending out to the Saskatchewan plains and northward to the valleys of Yukon. My interpretation of *S. oreophila* is supported by the statement of Dr. Aven Nelson, under *S. decumbens*: "*S. oreophila* Rydb. . . . is merely the larger form from the lower stations."¹

Greene included both extremes in his original *S. decumbens*, Pittonia, iii. 161 (1897), giving an inclusive description of the "Very common species of the Rocky Mountains of Colorado and northward, in subalpine and alpine situations, but occupying dry slopes or summits; forming the greater part of Gray's *S. humilis*, var. *nana*." I am, accordingly, taking up *S. decumbens* in the sense of the alpine extreme which Gray chiefly had as his *S. humilis*, var. *nana*, this interpretation conforming to the later views of Rydberg and others.

As stated, Rydberg originally gave no diagnosis, but he gave sufficient clues so that it is evident that his *Solidago oreophila* was intended for the plant of the Rocky Mountain area with slender and elongate thyrses. His publication was as follows:

Solidago oreophila; *Solidago stricta* Hook. Fl. Bor. Am. 2: 4, mainly, 1834; not Ait., 1789; *S. humilis* Gray, Syn. Fl. 1²: 148, partly, as to the Rocky Mountain plant [Man. R. M. 153]; not Pursh.

At an altitude of about 2000 m.

MONTANA: Gap in the belt Mountains above White's Gulch, 1882, Canby.

With no diagnosis *Solidago oreophila* must go back for its typification to the earlier defined entities. The Rocky Mountain element placed by Gray under *S. humilis* is clear, so also is the Carlton House plant of

¹ Nelson in Coult. & Nels. New Man. Bot. Centr. Rky. Mts. 505 (1909).

Drummond, cited by Hooker under his inclusive *S. stricta*, for material of the latter sent by Hooker to Asa Gray was included by Gray under his *S. humilis*. Thus it is possible, with the aid of his subsequent descriptions, to interpret what Rydberg meant by *S. oreophila*; but such slipshod publication of new species is not to be recommended to others.

SOLIDAGO ROANENSIS Porter, var. **monticola** (T. & G.), comb. nov. *S. Curtisii* T. & G., β ? *monticola* T. & G. Fl. N. Am. ii. 200 (1838). *S. monticola* T. & G. ex Chapm. Fl. 209 (1860), not Jord. (1857). *S. alleghaniensis* House in Am. Midl. Nat. vii. 131 (1921).

Typical *Solidago roanensis* Porter, Bull. Torr. Bot. Cl. xix. 130 (1892), has the thyrses very dense, except sometimes at base; the involucre greenish and herbaceous to membranous and 5–5.5 mm. long; and the ligules deep-yellow. It is confined to the highest mountains of western North Carolina and adjacent Georgia, extending slightly northward into southwestern Virginia. When he described it as a species Porter was familiar with *S. monticola*, to which it has generally been reduced, yet he made no mention of nor comparison with the latter plant; and Asa Gray wrote upon a sheet of the large *S. roanensis* distributed as *S. monticola* from Roan Mountain (*J. D. Smith*): "Yes. I could not have thought it." Nevertheless there seems to be no clear line to separate it and the smaller *S. monticola* and even in Mackenzie's treatment in Small's Manual the two are united. Var. *monticola*, with a broader range, often at lower altitudes, from Maryland to Kentucky, southward to Georgia and Alabama, is smaller throughout, the slender thyrses or the slender racemiform branches (when a panicle is developed) more open; the involucres 4–5 mm. long, usually paler; and the ligules paler yellow or even whitish.

SOLIDAGO (§*VIRGAUREA*) **Deamii**, n. sp. (TAB. 418, FIGS. 1–3), *S. Randii* similis; caule 4–5 dm. alto supra minute piloso; foliis coriaceis pallidis glabris, basilaribus rosulatis obovatis apice rotundatis grosse serrato-dentatis basi late petiolatis, lamina 3.5–5.5 cm. longis 2–3.5 cm. latis; foliis caulinis 35–40, imis subpetiolatis oblanceolatis serratis, mediis superioribusque sessilibus minoribus integris acutis; inflorescentia thyrsioidea densa 1 dm. longa 4 cm. diametro; pedicellis nullis aut 1–8 mm. longis strigoso-pilosis; involucris cylindrico-campanulatis 6–9 mm. longis; bracteis stramineis chartaceis obtusis, 4-seriatis, exterioribus viridicostatis, costa dilatata, interioribus elongatis; disci floribus circa 12, lobis corollae 2 mm. longis; ligulis 8 luteis; antheris 2.7–3 mm. longis; achaeniis immaturis strigoso-pilosis.

—INDIANA: in a blow out at end of Section Line Road 2 miles east of Tremont, Porter Co., September 14, 1923, *C. C. Deam*, no. 39,707 (TYPE in Gray Herb.).

Solidago Deamii (FIG. 1) has the strongly coriaceous foliage of *S. speciosa* Nutt., but its strongly toothed and short-petioled radical leaves and its pubescent achenes promptly distinguish it from the smallest extremes of *S. speciosa*, which has long-petioled and entire or but slightly toothed radical leaves and glabrous achenes. In habit and in the crowded, sessile or short-pedicelled heads *S. Deamii* is suggestive of *S. Randii* (Porter) Britton, of northern New England, southern Quebec and northeastern New York; but *S. Randii* has submembranous dark-green foliage, the involucre (FIG. 4) smaller (5–6 mm. long), with thinner and narrower bracts, the orange-yellow disk-corollas (FIGS. 5 and 6) with shorter lobes and shorter (1.5–2 mm. long) anthers, the corolla-lobes and anthers (FIG. 3) of *S. Deamii* being much longer. *S. Deamii* is also related to *S. racemosa* Greene, var. *Gillmani* (Gray) Fern., but that has the leaves submembranaceous, the radical (FIG. 7) elongate-ob lanceolate and acute, the heads mostly long-pedicelled and the involucre bracts narrower.

SOLIDAGO simulans, sp. nov. (TAB. 419, FIGS. 1–5), planta *S. uliginosae* simulans; caule crasso glabro 8 dm. alto; foliis subcoriaceis glaberrimis eciliatis, basilaribus late oblanceolatis acutis 3–3.5 dm. longis 4.5–5 cm. latis crenato-dentatis basi attenuatis petiolo alato; foliis caulinis circa 20, imis elongatis petiolatis mediis superioribusque sessilibus minoribus lanceolatis integris acutis; inflorescentia cylindrico-thyrsoidea densa 2 dm. longo 3 cm. diametro ramis glabris brevis capitulis 3–10 gerentibus; pedicellis glabris 3–4 mm. longis; involucri cylindrico-campanulatis 6–7 mm. longis; bracteis stramineis chartaceis, 4-seriatis, exterioribus lanceolato-deltoides subacutis, interioribus oblongis vel oblongo-lanceolatis obtusis vel subacutis; disci floribus 9, tubo 2 mm. longo, fauce 2.5 mm. longo, lobis 2 mm. longis; ligulis 7, 1.5 mm. latis; acheniis maturis lineari-cylindricis 8–10-costatis strigoso-hirtellis 3.3–3.5 mm. longis.—Macon County, NORTH CAROLINA: moist rocks on the high mountains of Macon County, near Highlands, September 15, 1897, *Biltmore Herb.*, no. 5730 (TYPE in Gray Herb.); Wild Cat Ridge, Highlands, October, 1902, *E. E. Magee*.

Solidago simulans so closely resembles *S. uliginosa* Nutt. that it has been mistaken for it. It differs at once in its glabrous inflorescence, larger involucre (FIG. 2), long throat and limb and short tube of the disk-corolla (FIGS. 3 and 4) and much longer definitely pubescent achenes (FIG. 5); the branches of the thyrse and the pedicels of *S. uliginosa* being hirtellous, the involucre (FIG. 6) only 4–5 mm.

long and with narrower bracts, the disk corollas (FIG. 7) with relatively longer tube and shorter throat and limb, the achenes (FIG. 8) only 1.5–2 mm. long and usually glabrous. *S. simulans*, as yet known only from the high mountains of Macon County, North Carolina, is to be watched for elsewhere along the Blue Ridge. It is the extreme southern and montane representative of *S. uliginosa*, which crosses eastern Canada from Labrador to Manitoba, and reaches its south-eastern limit in West Virginia (Gormanian, alt. 2500 feet, *Svenson*, no. 4449).

Solidago simulans might, by current treatments, be traced to *S. austrina* Small. It differs from the latter in many characters: leaves with quite smooth margins (in *S. austrina* scabrous-ciliolate), the basal 3–3.5 dm. long and 4.5–5 cm. broad (in *S. austrina* 0.7–1.5 dm. long and only 1–2.5 cm. broad); cauline leaves about 20, attenuate-tipped, the median 1 dm. or more long (those of *S. austrina* 30–60, the middle and upper bluntish or with blunt callous tip, the median 3–5 cm. long); inflorescence dense, its racemes cylindric, not secund (in *S. austrina* lax and open with strongly secund racemes); involucre cylindric-campanulate, 6–7 mm. high, with chartaceous bracts, the outer lance-deltoid and acutish not conspicuously continued down the pedicels (in *S. austrina* the broader campanulate involucre (FIG. 9) shorter, with firm, green, oblong, obtuse bracts continuing indistinguishably down the pedicels); disk-corollas 6.5 mm. long (in *S. austrina* 3.7–4.5 mm.); mature achenes 3.3–3.5 mm. long (in *S. austrina* 2–3 mm.).

SHIFTING OF NAMES VERSUS ACCURATE IDENTIFICATIONS (PLATE 420). It is a commonplace to note that long-continued cultivation of plants, particularly if they be of naturally plastic groups and placed side-by-side with scores of their relations, renders them in some ways unlike the indigenous ancestors from which they were in part derived. This observation, though trite, is important in connection with the species of *Solidago* early proposed in Europe from plants which had long grown in the gardens. In his masterly and cautious life-long studies of the genus *Asa* Gray repeatedly commented on the impossibility of satisfactorily identifying with wild American plants most of the garden forms described by Willdenow, Miller and some other European authors. Occasionally the types of species described by Aiton from plants not too long grown and mixed with other species at Kew can be safely identified; but too many of Miller's types, from plants long grown in the old Chelsea Garden, are better allowed to

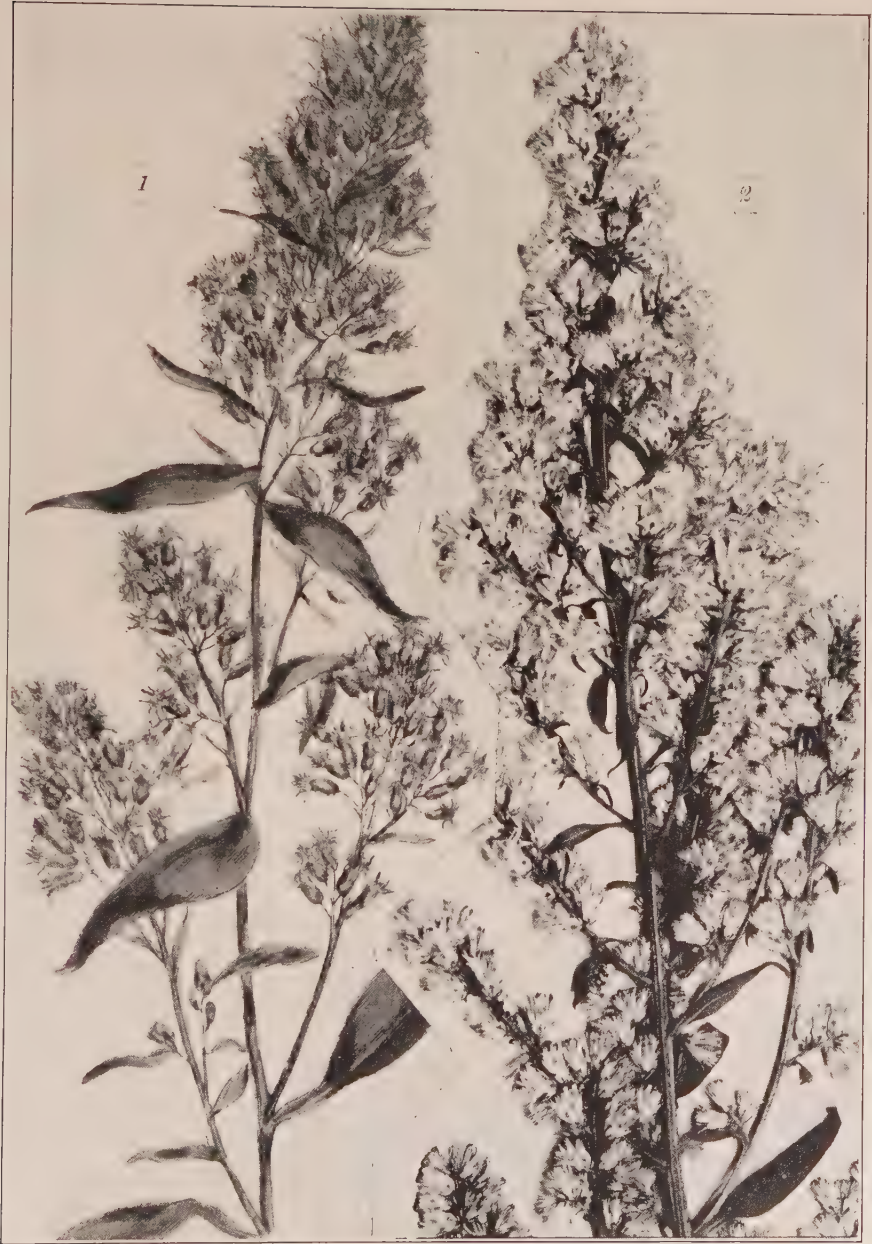


Photo. E. C. Ogden

SOLIDAGO CONFERTA: FIG. 1, inflorescence, $\times 1$, after Miller.
S. SPECIOSA: FIG. 2, upper half of inflorescence, $\times 1$, from Massachusetts.



Photo. E. C. Ogden

SOLIDAGO NEUROLEPIS: FIG. 1, TYPE, $\times \frac{2}{5}$; FIG. 2, lower surface of leaf, $\times 10$, from TYPE; FIG. 3, involucre, $\times 5$, from TYPE; FIG. 4, achene, pappus and disk-corolla, $\times 10$, from TYPE.

sleep where they lie. Among Miller's species which Gray, with the most profound knowledge of the types and their proper interpretation, refrained from placing as an identifiable American species was *S. conferta*.

Nevertheless, in recent years this name has been taken up with confident assurance to displace a perfectly valid and clearly typified name which had had a full century of accurate usage. One of the most definite species of eastern North America is *S. speciosa* Nutt., a tall (up to 2 m.) plant with coriaceous leaves and a thyrses made up of stiffish spiciform racemes of sessile or subsessile heads. The upper half of a characteristic inflorescence from Sheffield, Massachusetts (*F. Walters*) is shown, $\times 1$, in PLATE 420, FIG. 2. But in RHODORA, xxix. 17-19 (1927), the late Kenneth K. Mackenzie took up to replace Nuttall's perfectly familiar and unquestioned *S. speciosa* the name *S. conferta* Mill., asserting that

This species has been neglected because Miller failed to refer back to his finely illustrated work above referred to [Miller, Figs.] . . . In that work he . . . fully described (p. 170) under the same polynomial as in his later work and with practically identical description . . . the same species. . . his beautiful colored plate 254, fig. 2, one of the few colored plates of *Solidago* ever published, makes the identification of his species very certain.

Solidago conferta Miller is the species which many years later was called *Solidago speciosa* by Nuttall, and we must adopt the appropriate name of Miller instead of Nuttall's excellent name.

Most unfortunately many recent students have followed Mackenzie in discarding *S. speciosa* (PLATE 420, FIG. 2) for *S. conferta* (FIG. 1) and Mackenzie's characteristic positiveness would seem to justify such a procedure. Most of our students are not in a position to weigh such matters and they accept the latest pronouncement without healthy skepticism. Since Miller's plate 254, fig. 2, which unquestionably was his *S. conferta*, was to Mackenzie "very certain"ly *S. speciosa* I am reproducing the inflorescence, $\times 1$, as fig. 1, beside the upper half (fig. 2) of a characteristic thyrses of *S. speciosa*. Miller's plant was described by him correctly as having "The Flowers [*i. e.* heads] . . . produced in single loose Spikes from the lower Part of the Stalk at the Wings of the Leaves"—Mill. l. c. 170 (*italics mine*; the reference to *loose* spikes overlooked, or at least not mentioned by Mackenzie). The accurate characterization by Miller of the loose spikes and the very clear plate, showing the small heads on long filiform pedicels and the long foliaceous divergent bracts, are to me

very convincing reasons for not identifying Miller's garden plant, cultivated in England, with the American *S. speciosa*; and Mackenzie's certainty that the latter name should be thrown aside should serve as a caution to those who, it sometimes seems, are inclined to be more iconoclastic than precise in their identifications of old types.

What American species, if any, was the primary basis of *Solidago conferta* Mill. I do not know. The decidedly non-secund branches of the thyrses place it in the § *Virgaurea* which occurs abundantly in Europe. *S. uliginosa* Nutt. sometimes has the heads on long pedicels but never, so far as I have seen, divergent broadly lance-attenuate leafy bracts; and in the American allies of the European *S. Virgaurea* L. I know none which could safely be forced into *S. conferta*. My own inclination is to leave it, along with many which were specially noted by Gray, as a garden plant of Europe (reputedly of American origin) which cannot be positively identified with any species known to us in the wild.

Other cases of Mackenzie's unjustifiable abandonment of clearly typified and long established names for those which must always be open to question occur. The one here discussed and illustrated should suffice to put students of our flora on guard against such needless and groundless shifting of names.

SOLIDAGO JUNCEA Ait., forma **scabrella** (Torr. & Gray), comb. nov. *S. arguta*, γ. *scabrella* Torr. & Gray, Fl. N. Am. ii. 414 (1842). *S. juncea*, var. *scabrella* (Torr. & Gray) Gray, Syn. Fl. i². 155 (1884).

Supposed by Gray to be confined to the central states, but now known eastward to the limits of the specific range (Quebec and Virginia). The smooth-leaved typical *S. juncea* also extends as far west and southwest as the scabrous form.

S. JUNCEA Ait., forma **ramosa** (Porter & Britton), comb. nov. *S. juncea*, var. *ramosa* Porter & Britton in Bull. Torr. Bot. Cl. xviii. 368 (1891).

Originally from western New Jersey and adjacent Pennsylvania, Ohio and West Virginia, this form with erect branches occurs sporadically throughout the range of the species, at least eastward to New Brunswick and west to Michigan. It is a striking form but hardly a true geographic variety.

SOLIDAGO ARGUTA Ait., forma **tomophylla**, forma nov., foliis caulinis obovatis apice rotundatis vel subtruncatis margine grosse inciso-serratis. —NEW YORK: open pasture-slopes at 2100 feet alt.,

Maplecrest (Big Hollow), Green Co., August 26, 1931, *H. K. Svenson*, no. 4668 (TYPE in Gray Herb.).

Forma *tomophylla* is an extraordinary departure from typical *Solidago arguta*; but I can look upon it only as a sporadic variation such as occurs in several other species, exaggeration of the teeth appearing in individuals of *S. hispida* Muhl., *S. puberula* Nutt., *S. multiradiata* Ait., *S. Cutleri* Fern., *S. Randii* (Porter) Britton and numerous others. In *S. arguta*, forma *tomophylla*, however, the outline of the leaf is also aberrant. The sheet in the Gray Herbarium was collected on an excursion of the Torrey Botanical Club and the label says "Common on open pasture slopes, exposed to the south." In mid-August, 1935, Mr. E. C. Ogden and I searched the south-facing slopes above Maplecrest for it without success. *S. juncea* Ait. was abundant, *S. arguta* less so; but, if forma *tomophylla* still grows there, it successfully evaded us.

SOLIDAGO LUDOVICIANA (PLATE 422, FIGS. 2-5). In 1842, knowing the species only from about ten fragmentary specimens, Torrey & Gray treated *Solidago Boottii* Hook. as an all-inclusive species of five defined varieties. Later these varieties, originally designated without names, have received varietal and specific cognomens; and, with fuller material and understanding of their ranges, they are now practically all recognized as definite Alleghenian, Piedmont and Coastal Plain species. One of the latter has been not well understood, and since it is one of the most definite of the complex group it seems important to attempt clarification of it. Torrey & Gray had from Louisiana and Texas plants which they doubtfully placed with *S. Boottii* as

ε? glabrous; stem stout; leaves rigid, oblong, less acuminate, the lower serrate with spreading teeth; racemes dense, very numerous, forming an ample compound panicle.—T. & G. Fl. N. Am. ii. 214 (1842).

In 1882 Gray said under *S. Boottii*

Var. *LUDOVICIANA* is a dubious form, with larger heads and leaves.—Gray, Proc. Am. Acad. xvii. 195 (1882).

but in the Synoptical Flora he was more definite:

Var. **Ludoviciana**, Gray, l. c. Perhaps a distinct species, stouter, tall, rather large-leaved: lower leaves and lower part of the stem sometimes roughish-hirsute or hispidulous with many-jointed hairs, or glabrous: heads larger, even 4 lines long!—*S. Boottii*, var. ε, partly, Torr. & Gray, l. c.—W. Louisiana, *Hale*.—Gray, Synop. Fl. 12. 154 (1884).

Even as left by Gray in 1884 his *Solidago Boottii*, var. *ludoviciana* consisted of a plant with "lower leaves . . . roughish-hirsute or

hispidulous with many-jointed hairs" and another with them glabrous. A large series accumulated in recent years shows that the plants with hirsute leaves and those with them glabrous are, apparently, well defined species: the hirsute one *S. strigosa* Small, Fl. Se. U. S. 1198, 1339 (1903), correctly described with "blades strigose"; the glabrous one *S. ludoviciana* (Gray) Small, l. c. 1199, 1339 (1903), based on *S. Boottii*, var. *ludoviciana* Gray. Of the *Hale* material from western Louisiana marked by Gray as *S. Boottii*, var. *ludoviciana* there are two sheets: the one in the Torrey Herbarium is glabrous (TYPE of *S. ludoviciana* Small) and bears Gray's memorandum, "My specimen of this is hirsute"; the one in the Gray Herbarium is hirsute and bears Gray's memorandum, "The specimen in Hb. Torr. of var. $\frac{1}{2}$? is glabrous." Small having selected the glabrous plant of Hale to stand as the type of *S. ludoviciana*, that point is satisfactorily settled, the hirsute plant of Hale being *S. strigosa* Small. There are, as stated, many collections of both species now in the Herbarium of the New York Botanical Garden, where I have studied them, and in the Gray Herbarium; but, unfortunately, the late K. K. Mackenzie, rapidly becoming blind and suffering from a long-borne infection, apparently could not see them clearly, for at New York several sheets with the characteristic hirsuteness of *S. strigosa* were labelled by Mackenzie "*S. ludoviciana*." But the most puzzling confusion due to Mackenzie's distressing eye-sight in his later years arises in another connection.

Perplexed by certain inadequate specimens of the plant of southern New Jersey which has there passed as possibly *Solidago yadkinensis* (Porter) Small, I appealed to Mr. Bayard Long, who stated that the New Jersey plant has remained a problem for twenty-five years, a species readily recognizable and carefully accumulated in the local herbarium of the Academy of Natural Sciences of Philadelphia. Mr. Long kindly sent for study a large series of the New Jersey plant, a species of open sandy woods and thickets. In foliage, inflorescence, involucre, pappus, corollas and achenes it is a close match for *S. ludoviciana*, but all carefully collected New Jersey material has abundant filiform stolons and the autumnal rosettes have clearly arisen from such stolons. Otherwise the plant also superficially resembles *S. yadkinensis*, *S. Boottii* Hook. and *S. strigosa* Small.

In Mackenzie's treatment of *Solidago* in Small's Manual the three latter species, as well as *S. juncea* Ait., *S. arguta* Ait. and *S. Harrisii* Steele, all come under his *Argutae*, defined "Plant without long hori-



Photo. E. C. Ogden

SOLIDAGO NEUROLEPIS: FIG. 1, basal rosette, $\times \frac{2}{5}$, from TYPE.

S. LUDOVICIANA: FIG. 2, basal rosette, $\times \frac{2}{5}$, from Virginia; FIG. 3, involucre, $\times 5$, from TYPE; FIG. 4, disk-flower, $\times 10$, from Texas; FIG. 5, achene and pappus, $\times 10$, from New Jersey.

S. JUNCEA: FIG. 6, involucre, $\times 5$, from Massachusetts.



Photo. E. C. Ogden

SOLIDAGO ELLIOTTII, var. TYPICA: plants, $\times \frac{2}{5}$, from South Carolina.

zontal stolons," etc. The other plants of similar aspect would seem to constitute Mackenzie's *Vernae*: "Plants with long slender horizontal stolons," etc. The *Vernae* of Mackenzie are assigned two species, *S. verna* M. A. Curtis and the new *S. tarda* Mackenzie in Small, Man. 1355, 1509 (1933). I have studied at New York and now have on loan the type of *S. tarda*. In every way it is matched by the freely stoloniferous New Jersey material which is otherwise identical with the type of *S. ludoviciana*. Consequently, it is most significant to find that carefully collected material of *S. ludoviciana* displays the stolons (*A. A. & E. G. Heller*, no. 4122 from Arkansas and *E. J. Palmer's* no. 31714a from Gumwood, Texas—distributed without identification). The identity of *S. tarda* with *S. ludoviciana* seems sufficiently clear. Late in the autumn it produces filiform stolons (FIG. 2); but no material in the two large herbaria studied shows any such tendency in *S. yadkinensis*, the only species with which it might be confused, but from which *S. ludoviciana* differs in having the basal leaves broader and more abruptly contracted at base and less acuminate, the involucre (FIG. 3) even larger, 5–8 mm. high (against 5–6.5), the pappus (FIGS. 4 and 5) 4–5 mm. long (in *S. yadkinensis* 3–4), the disk-corollas (FIG. 4) 4.5–5.5 mm. long (in *S. yadkinensis* 4–4.5) and the achenes (FIG. 5) 2–2.8 mm. long (against 1.5–2.2). Incidentally the flowering periods of the two are quite different. *S. yadkinensis*, chiefly an Alleghenian and Piedmont species, flowers early: July 24–31 in Virginia, late June to early August in North Carolina, August in Georgia, the type, in fruit, collected at the Falls of the Yadkin on August 18th. *S. ludoviciana* is a species chiefly of the Coastal Plain, from Arkansas and eastern Texas to Georgia and in eastern Virginia (locally) and southern New Jersey (more frequently). In New Jersey the specimens in anthesis (rare in the woods, more frequent in the open) were collected from September 4 to October 6; the type of *S. tarda*, barely in flower, was collected in Clarke Co., Georgia on October 20th. There is, then, a difference of several weeks in the flowering periods of the two species.

Although the production of filiform stolons seems to be a specific trait of *Solidago ludoviciana* and their non-production a character of *S. yadkinensis*, *S. Bootii*, *S. Harrisii* and *S. arguta*, the character should be used with caution. In all the material of *S. verna*, including the type collection of M. A. Curtis,¹ at Cambridge and at New York I can find no stolons, yet Mackenzie certainly inferred them when he

defined the *Vernae* "with long slender horizontal stolons." In *S. strigosa* which he placed in the *Argutae* "without long horizontal stolons," there are 16 sheets before me. Of these, 13 are either broken off or jerked up, showing no well collected bases; but in *Caroline Dormon's* no. 1 from Natchitoches Parish, Louisiana, the carefully dug base shows the filiform stolons, quite like those of *S. ludoviciana*. On account of these stolons which he specially noted on the sheet, Mackenzie identified the collection as *S. tarda*, but the basal leaves have the characteristic pubescence of *S. strigosa*, not the glabrous surfaces of *S. tarda* (i. e. *S. ludoviciana*). Nevertheless *S. strigosa* can hardly be treated as hirsute *S. ludoviciana*. Its involucre are only 3.5–4.5 mm. high (in *S. ludoviciana* 5–8), its pappus only 2.5–4 mm. long (in *S. ludoviciana* 4–5) and its disk-corollas only 3.5–4 mm. long (in *S. ludoviciana* 4.5–5.5).

The quick way to tell the eastern *Solidago juncea* Ait. from the western *S. missouriensis* Nutt. is by their bases: *S. missouriensis* (with narrow "triple-nerved" leaves), even when pulled up displays filiform stolons; *S. juncea* (with the broader leaves not "triple-nerved") practically never has such stolons. Nevertheless, in the sandy south-eastern section of Massachusetts (Cape Cod, Martha's Vineyard, etc.) *S. juncea* with characteristic foliage, involucre and achenes, frequently develops stolons as slender and elongate as does the regularly stoloniferous *S. missouriensis*.

The character, therefore, is one to be used only after critical study and abundant experience. The development of filiform stolons in the late-flowering *Solidago ludoviciana* (*S. tarda*) seems to be a character of value in separating it from the early-flowering *S. yadkinensis*, which, as Messrs. Long, Fogg and I were able to check in eastern Virginia, bears a large rosette on a stout caudex, from which finally the flowering stem arises.

SOLIDAGO neurolepis, sp. nov. (TAB. 421 et TAB. 422, FIG. 1), *S. strigosae* similis; caule 1–1.5 m. alto glabro vel superne sparse piloso, foliis subcoriaceis supra glabris vel minute scabridulis subtus ad nervos hispidis vel glabris; foliis rosulatis longe petiolatis petiolis marginatis, laminis oblongo-ovatis 8–17 cm. longis 4.5–10.5 cm. latis grosse serratis, dentibus apice subulatis, basi rotundatis apice acuminatis; foliis caulinis 30–40 imis mediisque oblongo-ovatis vel -obovatis subsessilibus grosse acuteque serratis, superioribus reductis integris; inflorescentia paniculata laxa ramis remotis adscendentibus vel patentibus secundis, inferioribus ad apicem floriferis, superioribus per totam longitudinem floriferis; pedicellis brevibus erectis; involucris

cylindricis 3.5–4.5 mm. altis, bracteis stramineis valde inaequalibus, exterioribus perbrevibus lanceolato-attenuatis, intermediis lanceolato-attenuatis valde costatis costa glutinosa, interioribus linearibus sub-acutis vel obtusis; disci floribus 4 vel 5, tubo 1–1.5 mm. longo, fauce 1 mm. longo, lobis 0.6–0.8 mm. longis; ligulis 3 vel 4 ca. 0.3 mm. latis; pappi setis 2–2.5 mm. longis; acheniis maturis 1.3–1.5 mm. longis strigosis.—MISSOURI: dry bank, open woods, Oronogo, Jasper Co., August 29, 1920, *E. J. Palmer*, no. 18,863, distributed as *S. juncea* var. *scabrella*.

Solidago neurolepis, presumably on account of its large basal rosettes (PLATE 422, FIG. 1), was mistaken by Palmer for *S. juncea* and later, by Mackenzie, for *S. ludoviciana*. *S. juncea*, however, has the basal leaves narrower and more tapering at base, without the bristly ciliation of the nerves beneath; its cauline leaves are narrower and more rapidly decreasing upward; its involucre (PLATE 422, FIG. 6) hemispherical, with oblong and blunt bracts, its disk-flowers about 10 and its ligules 8–12. *S. neurolepis* is sufficiently distinct from it in the rounder-based leaves, with characteristic pubescence (PLATE 421, FIG. 2) beneath, the broad and sharply toothed median cauline leaves, the slender heads (FIG. 3) with attenuate bracts and the few flowers. *S. ludoviciana*, as shown on p. 210, has the base (PLATE 422, FIG. 2) with filiform rhizomes and stolons, the leaves quite glabrous, the campanulate involucres (FIG. 3) very large (5–8 mm. high), with oblong and obtuse bracts, with midrib dilated upward, the disk-corollas (FIG. 4) 8–10 and 4.5–5.5 mm. long, the ligules about as numerous and unusually broad, the achenes (FIG. 5) 2–3 mm. long, with pappus 4–5 mm. long.

In habit and large rosette-leaves with veins hispid or hirsute beneath *Solidago neurolepis* is somewhat like *S. strigosa* Small, but that species, like *S. ludoviciana*, is slenderly stoloniferous, and its heads are much fuller than in *S. neurolepis* and with obtuse linear-oblong bracts.

THE VARIATIONS OF *SOLIDAGO ELLIOTTII* (PLATES 423–425). *Solidago Elliottii* Torr & Gray was originally conceived as a plant of North and South Carolina and Georgia, its type being a specimen from Parris Island collected by Stephen Elliott. Among other characters it had “leaves . . . oblong-lanceolate or elliptical, mucronate-acute or somewhat acuminate . . . veiny, . . . , heads in crowded recurved racemes.” It was supposed to be the *S. elliptica* of Elliott, not Ait. At the same time Torrey & Gray

supposed a more northern plant to be *S. elliptica* Ait., but subsequently Gray cast doubt on the identity of Aiton's *S. elliptica* with any indigenous American plant: 'Cultivated from early times in European gardens, not identified as indigenous';¹ and at that time he referred the northern plant to the southern *S. Elliottii*, a course which has been followed by most later students. The only doubt of this identity seems to be the comment by Mackenzie in Small's Manual in his treatment of *S. Elliottii*: "This species seems to be known only from the original specimen from Parris Island, S. C. Specimens ranging all the way from eastern Georgia to eastern Canada have been erroneously referred to it."

Material of the original Parris Island plant preserved in the Torrey Herbarium (with fragments in the Gray Herbarium) agrees with much other material from South Carolina in having elliptical short-tipped, not long-acuminate leaves, and a panicle with strongly divergent or recurving racemes.

In these two characters it is quite distinct from the plant of swamps from Delaware to eastern Massachusetts and Nova Scotia. The latter has the leaves mostly narrower and long-acuminate and the panicle with strongly ascending to barely spreading branches and the foliaceous bracts are usually more developed. Some collections, especially from Rhode Island, strongly approach the South Carolina plant in habit but they have the leaves prolonged as in the usual New England plant. In the details of the heads I find essentially no difference. The South Carolina material (true *S. Elliottii*) has the involucre 4.5–5.5 mm. high, its median bracts 0.8–1 mm. broad, the disk-corollas 4.5–5.5 mm. long with lobes 1.5–2 mm. long, the pappus 3.5–4.5 mm. long and the ripe achenes 1.5–1.8 mm. long. The northern series shows similar measurements, with slightly more variation (due to more abundant material): involucre up to 6.5 mm. high and disk-corollas 4–5 mm. long. There is certainly not enough difference to keep the two series apart as species.

In eastern Virginia *Solidago Elliottii* is represented by a plant with the foliage much as in the northern variety but with a pyramidal open panicle with spreading branches and long-pedicels, the former character reminiscent of true *S. Elliottii*. But this Virginian plant has the involucre and flowers small for the species: involucre 3.5–4.5 mm. high, with the median bracts only 0.5 mm. broad, disk-corollas

¹ Gray, Syn. Fl. N. A. i², 143 (1884).



Photo. E. C. Ogden

SOLIDAGO ELLIOTTII, var. ASCENDENS: TYPE, $\times \frac{2}{5}$.



Photo. E. C. Ogden

SOLIDAGO ELLIOTTII, var. PEDICELLATA: TYPE, $\times \frac{2}{5}$.

4–4.2 mm. long, pappus only about 3–3.5 mm. long, and achenes only 1.2 mm. long. It thus approaches *S. rugosa* Mill., var. *sphagnophila* Graves, but that has the small involucre (3–4 mm. long) crowded and short-pedicelled, the smaller disk-corollas (2.5–3.5 mm. long) with lobes only about 1 mm. long, and the short pappus (2–2.5 mm. long) of *S. rugosa*. I am, therefore, tentatively treating the plant of eastern Virginia as a variety of *S. Elliottii*.

Farther south, in Florida, *Solidago Edisoniana* Mackenzie has the aspect of the northern variety of *S. Elliottii*, with the foliose panicle with strongly ascending branches, but its leaves are firmer and more prominently toothed. Its involucre, disk-corollas, and pappus give the same measurements and proportions, except that the pappus may be a fraction of a millimeter longer.

It seems to me, therefore, that *Solidago Elliottii* is best treated as a polymorphous species of the Coastal Plain and adjacent provinces, characterized as a species by its glabrous stems, rachis and foliage, and its large heads (involucre 3.5–6.5 mm. high), broadish, blunt bracts (the median 0.5–1 mm. wide), long disk-corollas (4–5.5 mm. long) with lobes 1.5–2 mm. long, long pappus (3–5 mm. long) and large ligules (0.5–1 mm. broad). It seems to have four geographic varieties:

S. ELLIOTTII Torr & Gray, var. **typica**. *S. Elliottii* Torr. & Gray, Fl. N. Am. ii. 218 (1842); Gray, Syn. Fl. i.² (1884), as to southern plant only; Mackenzie in Small, Man. 1358 (1933).—Swamps of North and South Carolina and Georgia. PLATE 423.

Var. **ascendens**, var. nov. (TAB. 424), foliis oblanceolatis vel oblongis acuminatis submembranaceis; ramis panicularum valde ascendentibus; involucri 4.5–6.5 mm. altis breviter pedicellatis, bracteis mediis 0.7–1 mm. latis; disci corollis 4–5 mm. longis lobis 1.5–2 mm. longis; antheris 1.5–2 mm. longis; pappi setis 3.5–4.5 mm. longis; achaeniis 1.5–1.8 mm. longis.—Swamps and wet thickets, Delaware to eastern Massachusetts; western Nova Scotia. TYPE: sandy thicket, Harwich, Massachusetts, September 21, 1927, *M. L., Katharine and H. G. Fernald* in Pl. Exsicc. Gray. no. 492 (in Gray Herb.).

Var. *ascendens* is the plant which was mistakenly called *Solidago elliptica* Ait. by Gray. It has generally passed as *S. Elliottii* in the northern Manuals. Freely hybridizing with *S. rugosa* and *S. rugosa*, var. *sphagnophila*. *S. Elliottii*, var. *divaricata* Fernald, RHODORA, xvii. 7 (1915) is a hybrid of var. *ascendens* and *S. rugosa*, var. *typica*.

Var. **pedicellata**, var. nov. (TAB. 425), foliis oblanceolatis vel

elliptico-lanceolatis acuminatis, membranaceis; ramis panicularum laxe patentibus; involucris 3.5–4.5 mm. altis longe pedicellatis, bracteis mediis 0.5 mm. latis; disci corollis 4–4.2 mm. longis; pappi setis 3–3.5 mm. longis; acheniis 1.2 mm. longis.—Eastern Virginia. TYPE: border of wet pine woods, Eastville, October 12, 1935, *Fernald & Long*, no. 5520 (in Gray Herb.)

A plant in young bud only, from bushy clearings and borders of woods west of Hampton, Virginia (*Fernald, Long & Fogg*, no. 5091) is apparently the same.

Var. **Edisoniana** (Mackenzie), comb. nov. *S. Edisoniana* Mackenzie in Small, 1358 (1933).

THE *SOLIDAGO RUGOSA* COMPLEX (PLATES 426–430). Probably no aggregate-species of *Solidago* in America, unless it be the *canadensis* group, is more baffling in its variations than *S. rugosa* Mill. (including *S. aspera* Ait.) Already difficult enough as a series of plants, its elucidation has not been helped by the interpretation of the late K. K. Mackenzie.¹ Wandering through the mazes of the always vague and often inconclusive pre-Linnean accounts and drawings of plants in European gardens prior to 1753, the initial date of our nomenclature, he concluded that the plant which Linnaeus had cultivated at Upsala and described as *S. altissima*, “*SOLIDAGO paniculata-corymbosa, racemis recurvis, floribus adscendentibus, foliis nerviis subintegerrimis*,”² is *S. rugosa* Mill. Early botanists had identified our inclusive *S. rugosa* as *S. altissima*, but Asa Gray, after a life-time of actual study of the original specimens in *Solidago*, settled the matter for all who wish it settled by showing that *S. altissima* must stand for the relative of *S. canadensis* “with thicker and more obscurely triple-nerved leaves than ordinary *S. Canadensis*”; and that the specimen in the much altered and disturbed Linnean herbarium of today, bearing the name *S. altissima* and belonging to *S. rugosa*, was so labeled by Sir J. E. Smith after the death of Linnaeus and cannot be accepted as in any way the Linnean type: “A specimen ticketed . . . by Smith ‘*altissima*’, is the species which has so long [erroneously] passed as *S. altissima*, viz. *S. rugosa*.”³ In the study referred to, Gray concluded that for the plant (our *S. rugosa*) which had erroneously passed as *S. altissima* “we must now fall back to the oldest and in the main most appropriate name, *S. rugosa*, Mill. Dict.”⁴

¹ Mackenzie in RHODORA, xxix. 75 (1927).

² L. Sp. Pl. ii. 878 (1753).

³ Gray, Proc. Am. Acad. xvii. 177 (1882).

⁴ Gray, l. c. 180.

Gray's decisions were based upon a thorough and dispassionate weighing of the complicated evidence and nothing is gained by attempts to overthrow his decisions merely on the basis of sophisticated bibliographic twists without fuller knowledge of the actual specimens which Linnaeus had before him. Incidentally it should be noted that the original Linnean account (*Hortus Upsal.* 259) in 1748 said of his *S. altissima* "foliis enerviis integerrimis," a phrase altered in 1753 (our starting point) by changing *integerrimis* to *subintegerrimis*.

The original (1748) account by Linnaeus amplified the brief diagnosis by a series of comparisons with the preceding species, *S. canadensis* L.

Obs. *Praecedenti valde affinis a qua differt:* 1. Foliis crassioribus, margine vix vel parum scabris, superficie vix manifeste trinervi. 2. Caule duplo altiore, seu quadrupedali. 3. Tempore florendi seriore, scilicet octobri.

Mackenzie's own description of *S. rugosa* (his "*S. altissima*") in Small's Manual reads: "leaf-blades . . . sharply-serrate, . . . thin, prominently veined." Surely, it is most difficult to coordinate Mackenzie's "*S. altissima*" (*S. rugosa*), with sharply serrate, thin, prominently veined leaves with the Linnean account of a plant with entire (or subentire), thick leaves with veins not apparent. Gray's wise decision should be accepted as definitely settling the specific identities; nothing but confusion follows by insisting that by entire, thick and veinless Linnaeus really meant sharply serrate, thin and prominently veined!

As to Mackenzie's insistence that *Solidago altissima* L. is not the tall thick- and often entire-leaved plant with which Gray and afterward I, merely following Gray, identified it, it is noteworthy that the original Linnean account said that the plant flowers later (in October) than *S. canadensis* and that it came from Maryland. As represented in the Gray Herbarium *S. canadensis* is little shown from Maryland southward, while *S. altissima* of Gray's and my own interpretation is more abundant, being the most abundant species of eastern Maryland and Virginia. The flowering material bears the following dates:

S. CANADENSIS. From Maryland, September 16; from West Virginia, September 5 and 10.

S. ALTISSIMA. From Maryland, September 16 and 24; from West Virginia, September 22, October 3 and 19; from Virginia, September 23, October 14 and 20.

I see no grounds for upsetting the use of *S. altissima* for the plant so treated in Gray's Manual.

There is, however, the necessity to settle just which of the numerous variations within the complex series we call *Solidago rugosa* Philip Miller had. So long as the group was treated merely as "Polymorphous, not readily sorted into definable varieties," Gray's treatment in the Synoptical Flora, the question could be passed. But now that we know the thin-leaved plant with elongate and acuminate, sharply serrate, smooth or merely villous-backed blades to have the involucre bracts also thin and elongate (linear-lanceolate and tapering to tip) and to have a broad northern range, while the plants with thicker, firmer and more rugose and harshly scabrous leaves have the involucre bracts commonly linear and round-tipped, and are prevalently of southern range, the exact identity of Miller's plant becomes important.

Probably there is no type extant for *Solidago rugosa*. Miller's description (species no. 25, Gard. Dict. ed. 8) is not wholly satisfactory, especially his *entire* leaves; but the garden plant was said to have come from New England, to have hairy, round stems $2\frac{1}{2}$ feet high, lanceolate, rough leaves, "those on the lower part are two inches long, and half an inch broad, but are gradually smaller to the top," panicle loose, with long lower branches with intermixed leaves. This, in view of Miller's lack of understanding of more technical characters in *Solidago*, is well enough and nothing will be gained by changing the interpretation of *S. rugosa* as now generally understood. William Aiton (or presumably Solander), who was a contemporary of Miller and had material of his species growing at Kew, supposed *S. rugosa* to be *S. altissima* L., as already sufficiently emphasized. Aiton divided the "*S. altissima*" growing then at Kew into five unnamed varieties, his *S. altissima* ϵ being what was then understood by Miller's contemporaries as *S. rugosa*, a plant with the habit and narrow-based and acuminate leaves of northern *S. rugosa* but with the margins entire or only barely toothed. That this garden material is quite like the plant which Miller had there can be little doubt. It is the extreme of ordinary *S. rugosa*, as currently understood, with the least developed toothing. The other plants which Aiton associated with it, his *S. altissima* vars. α , β , γ and δ , are slight variations of the same thing, differing in breadth of leaf, toothing of the margin and elongation of panicle-branches. I have before me photographs of all these trivial variations which I took at the British Museum in 1903. They all belong to *S. rugosa* as usually interpreted. In 1814 Pursh took

up three of Aiton's unnamed varieties and assigned them names under *S. altissima*, with the pregnant comment: "It is a very variable species, and scarcely two individuals look alike." Another of Aiton's varieties, his *S. altissima* ϵ , which Aiton had considered to be *S. rugosa* Mill. (Aiton's material closely matching Miller's description), was treated by Pursh unequivocally as *S. rugosa*; and another, *S. altissima* β . of Aiton, (said by Aiton to be *S. pilosa* Miller) Pursh treated as synonymous with his new *S. villosa*. The type of Aiton's *S. altissima* β =*S. pilosa* Mill., however, is only a slight transition toward the type of *S. villosa* Pursh, photographs of both being before me.

Typical *Solidago rugosa* passes into the ecological var. *villosa*, which was *S. villosa* Pursh. These two plants, predominantly northern and of damp habitats, have usually villous stems, lanceolate to narrowly ovate or oblanceolate, usually sharply serrate leaves which are narrowed to base and acuminate at tip, rather thin, only slightly harsh above, villous-hirsute on the loose but not prominently rugose veins beneath, and their involucre bracts are thin (subherbaceous), greenish and linear or linear-lanceolate and tapering or only subobtusate at tip.

In drier, often quite dry, habitats of the South, extending into the warmer parts of the North, there is another series, *S. aspera* Ait. and *S. celtidifolia* Small, with the stems scabrous-puberulent or short-hirsute (rarely villous); the leaves from lanceolate to rounded-ovate and firm, harshly scabrous above, coarsely rugose-veiny and scabrous-hirsute beneath, the bases mostly rounded and the margins with low or crenate teeth. In these two plants the involucre bracts are rather firm, linear to linear-oblong and usually round-tipped. In their extreme developments they would seem to constitute a separate species, but, unfortunately, too many transitions in leaf-outline, toothing, and involucres occur to allow me to treat them as specifically distinct from *S. rugosa*. Their corollas, pappus and achenes are, likewise, not materially different and I am looking upon them as a pair of somewhat xerophytic austral varieties. This interpretation is strengthened by the fact that the type and a few other extreme specimens of *S. celtidifolia* have the involucre bracts as slender and as thin as in the more northern typical *S. rugosa*, but decidedly longer.

Another series which is quite baffling is the group of glabrous plants which was set off as *Solidago rugosa*, var. *sphagnophila* by Graves in 1904 and, eleven years later, as *S. aestivalis* Bicknell. When Bicknell

described this glabrous plant as a species he correctly characterized it as

closely related to *S. rugosa*, but having a much earlier flowering period, . . . three to five weeks in advance of *S. rugosa* and much of it . . . past flowering at the time the latter begins to bloom. The close relationship of *S. aestivalis* to *S. rugosa* is evident enough, and examples are not wanting that suggest either that the two are sometimes intergradient or that they occasionally hybridize. Nevertheless it would be little doubted, I think, by anyone coming to know *S. aestivalis*, that it was essentially distinct, and long ago it became to me an authentic and, from its early time of flowering, a particularly interesting member of the golden-rod group. Its smooth and purple striate-angled stem is notably at contrast with the more terete and papillate-hirsute or villous stem of normal *S. rugosa*, although its smoothness may not be taken as a strictly determining character, for *S. rugosa* occasionally passes into glabrate forms; but such divergent plants, as I have met with them on Long Island, are obviously only local variations from the type not at all to be correlated with the normally glabrous stemmed *S. aestivalis*. In view of such variations, however, the characters of the latter might be given less weight did not its definitely earlier flowering period, both in its beginning and ending, imply a very pronounced remove from identity with the broadly similar *S. rugosa*.¹

Bicknell's discussion will be seconded by all who know the smooth plant of the Coastal Plain and the Piedmont; its early flowering is very real, but the flowering season, as shown in the abundant herbarium material from southern New England, overlaps that of *S. rugosa* more than he found to be the case on Long Island. The striate-angling of the stem is evident in most material, though occasionally not apparent, and too often in both the northern and inland villous-stemmed *S. rugosa* and in the southern scabrous-hispid *S. aspera* the pronounced angles can be seen (obscured only by the presence of a blanketing pubescence). In plates 426 to 429 I show such stems from the different plants of the group, merely to indicate the difficulty encountered in applying this character as a truly distinctive one.

Bicknell's characterization calls for involucreal "bracts linear-oblong to linear, obtuse" as in *S. aspera* and much of *S. celtidifolia*, and in slightly more than half of the material in the Gray Herbarium that is the case; but in the remainder, including some of the type-collection of *S. rugosa*, var. *sphagnophila*, the bracts are as narrow and attenuate as in the most ideal *S. rugosa*. Yet it can scarcely be maintained that Dr. Graves's variety is different from Bicknell's species. Graves's original account called for "Stems . . . angular-striate, very

¹ Bicknell, Bull. Torr. Bot. Cl. xlii. 561, 562 (1915).

smooth, usually dark red or purple . . . involucre . . . its bracts . . . linear-subulate to oblong-linear, acute or obtuse” and Graves gave a discussion very similar to that of Bicknell eleven years later!

As to whether it should be looked upon as specifically distinct from *S. rugosa* there might be an honest difference of opinion, but on account of the discovery of a few plants showing intermediate characters it seems best to regard it as a well marked variety of that species. . . . Not the least interesting feature of this variety is its time of flowering. It is one of our early goldenrods, following close after *S. juncea*, Ait., and *S. odora*, Ait., and antedating *S. rugosa* in the same neighborhood by at least four weeks. This past summer it began to bloom about August first, was well in flower a week or ten days later, and by the end of the month—at a time when the species was barely beginning—the variety was practically out of bloom.

It is readily distinguished from the species by its perfectly smooth, more striate and usually darker stem, and its relatively smooth leaves. Its early flowering season and its habitat also constitute significant points of distinction.¹

There is much to say for recognizing *Solidago aestivalis* as a species, but I am so constituted that I cannot accept as true species in *Solidago* plants without definite morphological differences. I have vainly sought stable characters of corollas, achenes, pappus and anthers, such as clearly separate these plants from *S. Elliottii* and such as separate all other habitally similar but morphologically distinct species. I should welcome the designation of such characters by those who prefer to call *S. aestivalis* a species; but I am forced, until a new light is shed on the question, to treat *S. aestivalis* as *S. rugosa*, var. *sphagnophila* Graves.

The following brief summary gives the conclusions I reach in studying the group of *Solidago rugosa*. Since the group is so complex I have felt it important for clarity to illustrate each of the varieties I recognize. I have also added some details of involucre, etc. which may be of service.

S. RUGOSA Mill., var. **typica**. *S. rugosa* Mill. Gard. Dict. ed. 8, no. 25 (1768); Pursh, Fl. ii. 337 (1814), and later authors in part. *Virga aurea Novae Angliae, rugosis foliis crenatis* Dill. Hort. Elth. 416, t. cccvii. fig. 396 (1732), very similar to Miller's description and to the Hort. Kew material which Aiton, and after him Pursh, considered *S. rugosa*; the name used by Miller probably derived from Dillenius or from Hermann before him. *S. pilosa* Mill., l. c. no. 9 (1768), as interpreted by Aiton. *S. virginiana* Mill., l. c. no. 11 (1768), as inter-

¹ Graves, RHODORA, vi. 83, 184 (1904).

preted by Aiton and by Pursh. *S. recurvata* Mill. l. c. no. 28 (1768), as interpreted by Aiton and by Pursh. *S. altissima* Ait. Hort. Kew. iii. 212 (1789),¹ including vars.; Pursh, l. c. 336 (1814); Torr. & Gray, Fl. ii. 216 (1842), in part; Mackenzie in RHODORA, xxix. 75 (1927) and in Small, Man. 1358 (1933), not L. Sp. Pl. ii. 878 (1753). *S. altissima*, α . *vulgaris*, β . *recurvata* (Mill.) and γ . *virginiana* (Mill.) Pursh, l. c. (1814). *S. altissima*, var. *rugosa* (Mill.) Torr. Fl. N. Y. i. 363 (1843).—Stem sordid-villous, without or with decurrent lines running down the stem from the leaf-bases and midribs; leaves lanceolate to narrowly ovate or oblanceolate, acuminate, gradually tapering at base, commonly sharp-serrate with coarse teeth, usually rather thin and loosely veiny, not conspicuously rugose, more or less villous beneath; the median leaves 0.5–1.3 cm. long; the upper leaves gradually reduced in size, 1–7 cm. long, 0.5–1.5 cm. broad, much shorter than the long curving lower branches of the usually broadly pyramidal panicle; involucre 3–4 mm. high, their bracts linear or linear-lanceolate, thin, greenish, attenuate to bluntish.—Damp open soil, thickets and borders of woods and streams, Newfoundland to Ontario, south to western Virginia, West Virginia and Louisiana, abundant northward, less so southward. Flowering August–October. Passing into vars. *villosa*, *aspera* and *sphagnophila*. PLATE 426.

Vars. *glabrata* and *laevicaulis* Farwell, Am. Midl. Nat. ix. 277 (1925) have the characteristic pubescence through the panicle and on the lower leaf-surfaces, but their stems below the panicle are glabrous.

Var. *VILLOSA* (Pursh) Fernald in RHODORA, x. 91 (1908). *S. villosa* Pursh, Fl. ii. 537 (1814). *S. altissima*, var. *villosa* (Pursh) Torr. Fl. N. Y. i. 363 (1843), at least as to source of name.—Panicle elongate-pyramidal to cylindric, the lower lateral racemes nearly equaled to overtopped by the large (0.5–1 dm. long, 1–3.5 cm. broad) subtending leaves; involucre as in var. *typica*, often slightly larger; pubescence as in var. *typica* or longer and more copious.—Low grounds, Newfoundland to Ontario, often the abundant form, becoming infrequent southward to Virginia, West Virginia, Ohio and Michigan. Flowering from early July (northward) to October (southward). PLATE 427.

Var. *SPHAGNOPHILA* Graves in RHODORA, vi. 183 (1904). *S. aestivalis* Bickn. in Bull. Torr. Bot. Cl. xlii. 561 (1915).—Stems glabrous, often purplish, commonly with prominent stripe-like ridges decurrent from the bases of the leaves; leaves glabrous, lanceolate to narrowly elliptic, rather firm, appressed-serrate, the median 0.6–1.2 dm. long, the upper reduced; panicle much as in var. *typica* or more compact, its rachis and branches glabrous or only sparsely pubescent; involucral bracts linear-lanceolate to linear-oblong, acute or obtuse.—Swampy, often boggy, habitats, southern Maine to North Carolina. Flowering through August and September. PLATE 428.

¹ Aiton's treatment taken over for the most part by Willd. Sp. Pl. iii⁹. 2058 (1804) with the acknowledgment: "*Varietatem α . tandem vidi, a Clariss. Aiton indicatas vero non.*"



Photo. E. C. Ogden

SOLIDAGO RUGOSA, var. *TYPICA*: FIG. 1, plant, $\times \frac{2}{5}$, from Connecticut; FIG. 2, internode and leaf-bases, $\times 5$, from Maine; FIG. 3, lower surface of leaf, $\times 10$, from Nova Scotia; FIG. 4, involucre, $\times 5$, from same specimen.



Photo. E. C. Ogden

SOLIDAGO RUGOSA, var. *VILLOSA*: FIG. 1, inflorescence, $\times \frac{2}{5}$, from Quebec; FIG. 2, inflorescence, $\times \frac{2}{5}$, from Magdalen Islands; FIG. 3, internode and base of leaf, $\times 5$, from Newfoundland; FIG. 4, involucre, $\times 5$, from same plant as FIG. 1.

Var. *ASPERA* (Ait.) Fernald in *RHODORA*, xvii. 7 (1915). *Virga aurea Americana aspera* Dill. Hort. Elth. 411, t. cccv. fig. 392 (1732). *S. aspera* Ait. Hort. Kew. iii. 212 (1789); Willd. Sp. Pl. iii³. 2057 (1804); Pursh, Fl. 535 (1814), and later authors. *S. altissima* ϵ , Torr. & Gray, Fl. ii. 217 (1842).—Stems scabrous-puberulent or short-hispid, rarely glabrous, terete or only occasionally angulate-striate; leaves oval or elliptic to lanceolate, rounded at base, subacute to short-acuminate, low-serrate to crenate, sometimes coarsely serrate, scabrous on both surfaces, thick and strongly rugose, the lower surface hispid; median leaves 2.5–10 cm. long, 1.2–4 cm. broad; panicle pyramidal, usually longer than broad, its ascending to spreading branches densely floriferous throughout or the lower sometimes merely leafy-bracted below, the reduced rameal leaves elliptic to lanceolate and acute; involucre 3–4 mm. high; their principal bracts firm, stramineous to pale-green, linear-oblong and round-tipped, 0.4–0.8 mm. broad.—Dry to damp open soil or thin woods and thickets, Florida to Texas, north to southern Maine, Ohio, Michigan and Missouri. Flowering from mid-August to October. PLATE 429.

Although var. *aspera* often appears quite distinct and, as already noted, is of generally more southern range and of drier habitats than var. *typica*, I find altogether too many transitions to justify maintaining it as a species. In view of the consistent and correct application of Aiton's name *aspera*, derived from Dillenius (1732), for more than two centuries, I am purposely maintaining the name in the varietal category, although extreme literalists, who place more weight on the letter of rules than their spirit, might urge my making a new combination based upon *S. aspera* var. *axillaris* Farwell, Rep. Mich. Acad. Sci. xiv. 189 (1913). Needless confusion would result by abandoning the bicentenarian and perfectly understood name *aspera* in its broadly inclusive sense and substituting, on a technicality, a name which was not so intended but which was definitely made subordinate to *aspera* and meant for a minor variation of it. I decline to be technically literal and to make a fetish of minor rules where only confusion and misunderstanding would result. Others, who look upon nomenclature as the end, not the means, will take another view.

Var. *aspera* passes into the following:

Var. *celtidifolia* (Small), comb. nov. *S. celtidifolia* Small, Fl. Se. U.S. 1198, 1339 (1903), and later authors.—Similar to var. *aspera* but the panicle very lax, its few distant very prolonged and divergent branches (up to 4.5 dm. long) floriferous chiefly above the middle, their bracteal leaves elliptic to oval; involucre 3.5–5.5 mm. long, the inner bracts often prolonged, linear, obtuse or acute, often membranaceous.—Dry to moist open woods, clearings and thickets, Georgia to Texas,

north to Virginia, southern Indiana and Arkansas. Flowering through September and October. PLATE 430.

SOLIDAGO AURICULATA Shuttleworth ex Blake in Journ. Wash. Acad. Sci. xxi. 326 (1931). *S. amplexicaulis* Torr. & Gray, Fl. N. Am. ii. 218 (1842), not Martens in Bull. Acad. Brux. viii. 67 (1841). *S. auriculata* Shuttleworth ex Gray, Syn. Fl. N. Am. 1². 153 (1884), as synonym. *S. notabilis* Mackenzie in Small, Man. Sc. Fl. 1353, 1509 (1933).

Mackenzie, in publishing *Solidago notabilis* in 1933, must have overlooked the proper publication in 1931 by Blake of Shuttleworth's manuscript name *S. auriculata*. The latter, validated by Blake, is correct; the former is a synonym.

THE VARIETIES OF *SOLIDAGO NEMORALIS* (PLATE 431). As I understand the species, *Solidago nemoralis* Ait. has three strongly defined geographic varieties, probably all of which have been treated as species but which show altogether too much intergradation. Typical *S. nemoralis*, the wide-ranging plant (a New Jersey specimen in the Gray Herbarium matched with the type by Asa Gray and Francis Boott), has the basal leaves broadly oblanceolate to spatulate-obovate; and the principal cauline ones decrease gradually in size to the summit, the upper reduced ones being narrowly oblanceolate. The heads are crowded on the branches of the panicle and vary with habitat and exposure from subsessile to more definitely short-pedicelled.

On the Prairies and Plains much of *Solidago nemoralis* has the leaves narrower, the basal narrowly oblanceolate to lance-linear, the upper cauline linear-oblanceolate or linear. This plant of the Plains has the heads (FIGS. 3-5) usually large for the species, though equally large heads (FIGS. 7-9, 11, 12) are often found in the more eastern plant, and the pedicels are often quite evident. This was first described in 1836 as *S. decemflora* DC. Prodr. v. 332 (1836), a sheet of the type number (*Berlandier*, no. 1924) in the Gray Herbarium being (except for greater discoloration) a good match for the type of *S. longipetiolata* Mackenzie & Bush in Trans. Acad. Sci. St. Louis, xii. 87, t. xvi (1902). Much of the latter plant, furthermore, seems to me inseparable from the type-collection of *S. diffusa* Nelson in Bull. Torr. Bot. Cl. xxv. 378 (1898), which, because the name is a later homonym, was altered to *S. pulcherrima* Nelson, l. c. 549 (1898). As far west as Wyoming this extreme of *S. nemoralis* is apparently rare, though it is now known

to reach Montana, Utah and Arizona, for in publishing it Nelson said "It is seemingly quite local as nothing approaching it has been secured in several years' collecting in the state." Nelson also added the illuminating footnote: "Dr. Rydberg suggests that this is the *S. nemoralis* of most of the Western Reports and states that its range extends from Kansas to the Saskatchewan. It is so very different from the eastern *S. nemoralis* that I had not associated the two at all."

The isotype of *Solidago pulcherrima* in the Gray Herbarium has the involucre bracts (FIG. 5) obtuse, the isotype of *S. longipetiolata* has them also obtuse (FIG. 3) but not quite so round-tipped, and the isotype of *S. decemflora* has them (FIG. 4) as in the Mackenzie & Bush type, or slightly acutish. In publishing *S. longipetiolata* Mackenzie & Bush specially emphasized the narrower leaves and the larger heads, which constitute the chief differential characters of the plant of the Plains, but they also said "Distinguished from *S. nemoralis* Ait. by . . . more imbricated involucre, with sharper scales, lower height, more simple inflorescence and much more pubescent achenes." As to the "lower height," they assigned their plant a height of "3-6 dm.", while Nelson had given for his earlier *S. diffusa* "stems 6-8 dm. long." Specimens distributed by Bush as his and Mackenzie's *S. longipetiolata* are 8 dm. high, and large specimens of it from Arkansas are 1.3 m. high. Such a height as the latter for *S. nemoralis* would be unusual and plenty of eastern material from arid and wind-swept habitats is depressed and with stems only 1-2 dm. long. The panicle of the western material is commonly more slender and with less divergent branches than in much of the eastern, but it is altogether too easy to find either form of panicle east or west. As to the "sharper scales" of the plant of the Plains it is significant that Rydberg, not averse to weak species, should have specially separated all the members of the series (*S. nemoralis*, *S. longipetiolata* and *S. pulcherrima*) from the slenderly stoloniferous *S. mollis*, etc. by "Bracts . . . obtuse."¹ Incidentally, although *S. nemoralis* has the bracts most commonly obtuse, the futility of trying to draw too fine a distinction on this character is shown by the occurrence of plenty of broad-leaved *S. nemoralis* on the Atlantic slope with acutish scales (FIGS. 6, 11, 12). In PLATE 431 I am showing involucre bracts from various areas which should make this point clear; they are all of the same magnification (× 5). FIG. 3, as explained, is from an isotype of *S. longipetiolata*,

¹ Rydb. Fl. Prair. Pl. 792 (1932).

FIG. 4 from an isotype of *S. decemflora* and FIG 5 from an isotype of *S. pulcherrima*. Certainly it is not easy to find fundamental differences to separate these involucre from nos. 7 (from Virginia), 8 (from Pennsylvania), 9 (from Maryland) and 10 (from Rhode Island); and, surely, it is difficult to make out, as Mackenzie & Bush, maintained, that the western has "sharper scales." FIG. 3, from the isotype of *S. longipetiolata* shows them obtuse enough; but FIG. 6 is from a specimen from Maine, FIG. 11, from one from New York and FIG. 12 from one from Prince Edward Island. The plants from which these were taken show no other points of difference to separate them from plants of the Atlantic slope which supply figs. 7-10. Similarly with the achenes; I find no appreciable difference. I am, therefore, unable to maintain the plant of the Plains as a species. It seems to me rightly called

S. nemoralis Ait., var. **decemflora** (DC.), comb. nov. *S. decemflora* DC. Prodr. v. 332 (1836). *S. diffusa* Nelson in Bull. Torr. Bot. Cl. xxv. 378 (1898), not Gray (1861). *S. pulcherrima* Nelson, l. c. 549 (1898). *S. longipetiolata* Mackenzie & Bush in Trans. Acad. Sci. St. Louis, xii. 87, t. xvi. (1902).—Western Ontario to northern Alberta, south to Kentucky, Arkansas, Texas and Arizona.

In his earlier work Asa Gray interpreted *Solidago decemflora* as *S. radula* Nutt. ("Probably what I referred to *S. decemflora*, in *Pl. Lindh.* 2, p. 222, likewise belongs here"—Gray, *Pl. Wright.* i. 95 (1852)); but when he had studied the Berlandier material from Texas, TYPE of *S. decemflora*, he made the correction under his discussion of *S. nemoralis*: "Some of the specimens have narrowly lanceolate leaves, and are *S. decemflora* DC.!"—Gray l. c. 94.

While botanizing on the "East Shore" of Virginia, in October, 1935, Messrs. Long, Fogg and I were much impressed with the woodland plant which, at least in Northampton County, largely replaces the widespread *Solidago nemoralis*. The latter has the leaves gradually decreasing in size up to the inflorescence, the upper ones being narrowly oblanceolate, and the heads are sessile or with only very short pedicels and crowded nearly to the bases of the divergent panicle-branches. The plant of pine woods on the Cape Charles Peninsula has the lower cauline leaves as in typical *S. nemoralis* but about midway on the stem they are abruptly reduced in size and altered in form, continuing to the summit as subuniform spatulate-obovate bracteiform leaves. The inflorescence, too, is comparatively lax, with the heads mostly on obvious pedicels up to three times the



Photo. E. C. Ogden

SOLIDAGO RUGOSA, var. SPHAGNOPHILA: FIG. 1, plant, $\times \frac{3}{5}$, from TYPE-collection; FIG. 2, internode and base of leaf, $\times 5$, from TYPE-collection; FIGS. 3 and 4, involucre, $\times 5$, from TYPE-collection.



Photo. E. C. Ogden

SOLIDAGO RUGOSA, var. *ASPERA*: FIG. 1, plant, $\times \frac{3}{8}$, from Massachusetts; FIG. 2, internode and leaf-base, $\times 5$, from Connecticut; FIG. 3, lower surface of leaf, $\times 10$, from Connecticut; FIG. 4, involucre, $\times 5$, from same specimen as FIG. 3.

length of the involucre and borne at the tips of the strongly ascending branches. In pubescence, basal and lower cauline leaves, involucres, flowers and achenes the plant is good *S. nemoralis*, its departures being in the reduction and shape of the upper leaves and the looser inflorescence with long ascending leafy branches. Exactly similar plants are in the Gray Herbarium from dry pine-barrens north of Leslie, Georgia (*Harper*, no. 1722), from Louisiana (*Hale*) and from eastern Texas (San Felipe de Austin, *Drummond*, no. 111), while they are strongly approached by material from the cedar glades of Tennessee (*Gattinger*) and from "barrens of Kentucky" (*Short*). The Texas, Louisiana and Kentucky specimens (along with one from Michigan which I should not place with them) constituted *S. nemoralis*, γ . of Torrey & Gray, with "leaves more scabrous; the upper short, obovate-spatulate." Unfortunately, Torrey & Gray assigned no name to this remarkable southern variety and I cannot find that it has been named, unless it is what Elliott meant when he described *S. cinerascens* Schweinitz in Ell. Sk. ii. 375 (1824). The typification of *S. cinerascens* is mixed between Elliott's own material from Georgia actually described and material, undescribed, which he had received from Schweinitz: "The plant I have described agrees in most respects with specimens sent me under this name from Salem, North-Carolina, by Dr. Schweinitz." In view of this confusion, the very indefinite condition of the Elliott plants and his characterization of the leaves as "long, linear-lanceolate," it is unwise to use for our variety the name given by Elliott to some similar plant; his "*leaves* . . . , the upper distant and small" and his "*peduncles* . . . longer than the involucre" sound like it, but it is safer to designate a new type. I am calling the extreme plant of the Southeast

S. NEMORALIS Ait., var. **Haleana**, var. nov. (TAB. 431, FIGS. 1 et 2), foliis caulinis inferioribus oblanceolatis 3–15 cm. longis, superioribus valde reductis spathulatis distantibus 0.5–3 cm. longis; ramibus panicularum ascendentibus apice recurvatis; racemis laxis pedicellis elongatis.—Texas to Georgia, north to Kentucky and eastern Virginia. TYPE: Louisiana, *Dr. Josiah Hale*, included under *S. nemoralis*, γ . TORR. & GRAY. Our Virginia material, not so extreme as the type, is from sandy pine woods at and east of Eastville, *Fernald & Long*, nos. 5524, 5525; dry pine woods north of Capeville, *Fernald, Long & Fogg*, no. 5526.

IN PLATE 431, FIG. 1 is the type of var. *Haleana*, $\times \frac{2}{5}$, FIG. 2 an involucre, $\times 5$; the other figures show involucres, $\times 5$, as already explained.

SOLIDAGO RADULA Nutt., var. *laeta* (Greene), comb. nov. *S. laeta* Greene, *Pittonia*, v. 138 (1903).

Although *Solidago laeta* is not sharply differentiated from *S. radula*, a series of plants extending from Texas into Missouri has the involucrel bracts broader and shorter (PLATE 432, FIGS. 4 and 5) than in the widely distributed typical *S. radula* (FIG. 3). FIG. 3 shows the involucre, $\times 5$ of typical *S. radula* from Grand Tower, Illinois (*Gleason*, no. 1844), FIG. 4, an involucre from an isotype of *S. laeta* (*Tracy*, no. 8137) and FIG. 5 the most extreme involucre of var. *laeta* (*Cory*, no. 4738), more extreme than in the type, which is somewhat transitional.

Another variation from typical and average *Solidago radula*, also in the southwestern corner of the specific range, Louisiana and eastern Texas to Missouri, has the panicle as broad and with as divergent branches as in the most extreme forms of *S. radula*, but the involucrel bracts very slender. Whereas var. *laeta* is the extreme of the specific aggregate with broadest bracts, this is the tendency with the narrowest. I am calling it

S. RADULA Nutt., var. *stenolepis*, var. nov. (TAB. 432, FIGS. 1 et 2), a var. *typica* recedit bracteis involucri angustioribus, interioribus anguste linearibus 0.3-0.5 mm. latis.—Missouri, Louisiana and Texas. MISSOURI: rocky open woods, limestone hills, near Carthage, Jasper Co., October 2, 1922, *E. J. Palmer*, no. 22,161 (TYPE in Herb. New York Botanical Garden). LOUISIANA: Cameron, September, 1906, *R. S. Cocks*, no. 1727. TEXAS: prairies, Houston, September 18, 1917, *E. J. Palmer*, no. 12,739.

In its very narrow involucrel bracts var. *stenolepis* departs from typical *Solidago radula* just as occasional aberrant plants of *S. nemoralis* will sometimes do. In the latter cases the departure seems due to some outside factor; in var. *stenolepis* it has every appearance of being normal.

The type of var. *stenolepis* bears an unpublished specific name written by the late K. K. Mackenzie. His judgment of it may eventually prove correct; as yet I have been unable to find any definite characters of habit, foliage, flowers and fruit which seem to be specific. Another sheet of specimens marked by Mackenzie as belonging to his unpublished species is so different in many characters that I am unable to cite it under var. *stenolepis*. Other sheets sent out by collectors under the unpublished binomial are likewise far removed from the type of var. *stenolepis*. The name given by Mackenzie but not published is so similar to *S. bracteata* Bush (1918) that its formal

publication would lead to confusion. I am, therefore, not using it. PLATE 432, FIG. 1 shows the type of var. *stenolepis*, $\times \frac{2}{5}$. In FIG. 2 the involucre is shown, $\times 5$, the same magnification as FIGS. 3–5.

SOLIDAGO Jacksonii (O. Ktze.), comb. nov. *S. corymbosa* Ell. Sk. ii. 378 (1822 or 1823), not Poir. Encyc. Suppl. v. 461 (1817). *Aster Jacksonii* O. Ktze., Rev. Gen. i. 316 (1891).

VII. MEMORANDA ON ANTENNARIA

ANTENNARIA munda, sp. nov. (TAB. 433). PLANTA FOEMINEA; foliis rosulatis spathulatis vel anguste spathulato-obovatis, apice rotundatis, petiolatis, lamina 2–6 cm. longa 1.3–5 cm. lata, 3–5-nervia supra minute canescenti-tomentulosa; stolonibus assurgentibus vel procumbentibus foliis terminalibus rosulatis; caulibus floriferis crassis 1–4 dm. altis dense tomentosis; foliis caulinis 6–15, imis oblanceolatis vel late lanceolatis vel anguste oblongis 4.5–8 mm. latis, mediis superioribusque lanceolatis attenuatis apice subulatis, subulo 0.6–1.4 mm. longo; capitulis 5–20 glomerulatis vel dense corymbosis, corymbis subglobosis 2–4.5 cm. diametro; involucris 8–10 mm. altis; bracteis 3–4-seriatis, basi brunneis vel purpurascens, exterioribus anguste oblongis apice obtusis erosis lacteis, bracteis interioribus angustatis acutis; corollis 5.5–7 mm. longis; stylo rufescente exserto bifido; acheniis maturis 1.5–1.8 mm. longis; pappi setis longioribus 8–9 mm. longis. PLANTA MASCULA (rarissima); parva, 1 dm. alta; corymbis densis 1.5–2.7 cm. latis; involucris 5 mm. altis; bracteis patentibus ovalibus lacteis apice erosis; pappi setis apice dilatatis integris vel undulatis.—Sandy, gravelly or sterile rocky fields and open woods, rarely damp meadows, central Maine to the Ottawa valley, Quebec, west to Thunder Bay Distr., Ontario, south to Massachusetts, Connecticut, northeastern Pennsylvania, central and western New York, northern Indiana and Minnesota. TYPE: sandy wooded slope, Orono, Maine, May 31, 1901, *Fernald* (in Gray Herb.)

Antennaria munda, named for its neat and comparatively elegant appearance as well as for its nearly spherical inflorescence, is the plant which has erroneously passed as *A. occidentalis* Greene. The latter was merely the prairie specimens of *A. fallax* Greene, Pittonia, iii. 321 (1898). Greene published *A. fallax* as occurring only in the District of Columbia; and he separated from it, on the next page (322) the plant “of the Illinois prairie region, and apparently westward to Kansas. . . . The species, as to the typical plant of central Illinois, was too hastily by me concluded to form a part . . . of what I have now named *A. fallax*” (Greene, l. c.). Described as “very similar” to *A. fallax* but with “cymose panicle of large female heads more open than in either,” Greene’s *A. occidentalis* can have

nothing to do with the more northern *A. munda*, which has been erroneously referred to it. Numerous sheets designated by Greene as *A. occidentalis* clearly demonstrate its essential identity with *A. fallax*, one of the most widely distributed species.

Antennaria munda was early supposed to be *A. Farwellii* Greene, l. c. 347 (1898). Several specimens from Mr. Farwell and a collection made by *Fernald & Pease* (no. 3552) at the type station show it to be a unique species, as yet known only from Keweenaw Co., Michigan and from the Bruce Peninsula, Ontario, a singular localization if those cytologists are correct who maintain that the parthogenetic species are modern "throw-offs" which have been rapidly spreading since the Wisconsin glaciation. The basal leaves (FIG. 3) of *A. Farwellii* are so very characteristic in their subtruncate summits, with the sides abruptly narrowed to a concave curve, that I am showing them in the plate with *A. munda*.

ANTENNARIA FALLAX Greene, var. **calophylla** (Greene), comb. nov. *A. calophylla* Greene Pittonia, iii. 347 (1898).

The southernmost representative of *Antennaria fallax* is striking in its very rounded or rounded-ovate rosette-leaves. The generally more northern *A. fallax* has the leaves rhombic-ovate to -obovate and tapering above to a subacute tip. The variety ranges from Georgia to Texas, coming north to North Carolina, Indiana, Illinois and Missouri, in the northern states passing insensibly into *A. fallax*.

ANTENNARIA NEGLECTA Greene, forma **simplex** (Peck), comb. nov. *A. neglecta*, var. *simplex* Peck, Bull. N. Y. State Mus. lxvii. Bot. vi. 33 (1903).

The unusual plants of *Antennaria neglecta* with a single terminal pistillate head are strikingly unlike the common plant with glomerulate to spiciform or racemose inflorescences, but the colonies occur sporadically and have no definite range.

ANTENNARIA NEODIOICA Greene, var. **argillicola** (Stebbins), comb. nov. *A. virginica*, var. *argillicola* Stebbins, RHODORA, xxxvii. 232 (1935). *A. virginica* Stebbins, l. c. 230 (1935).

Var. *argillicola* is well marked by its combination of often low stature, very narrow cauline leaves, relatively small pistillate involucre and the abundant staminate plants with involucre shorter than in the very few and rare staminate plants which are known in *A. neodioica* and its other varieties. The herbarium-specimens sent out indicate that Dr. Stebbins originally treated both his *A. virginica* and



Photo. E. C. Ogden

SOLIDAGO RUGOSA, var. *CELTIDIFOLIA*: FIG. 1, ISOTYPE of *S. celtidifolia* Small, $\times \frac{2}{5}$; FIG. 2, involucre, $\times 5$, from Arkansas; FIG. 3, involucre, $\times 5$, from ISOTYPE; FIG. 4, involucre, $\times 5$, from Virginia.



Photo. E. C. Ogden

SOLIDAGO NEMORALIS, involucre, $\times 5$: FIG. 6, from Maine; FIG. 7, from Virginia; FIG. 8, from Pennsylvania; FIG. 9, from Maryland; FIG. 10, from Rhode Island; FIG. 11, from New York; FIG. 12, from Prince Edward Island.

Var. DECENFLORA, involucre, $\times 5$: FIG. 4, from ISOTYPE; FIG. 3, from ISOTYPE of *S. longipetiolata*; FIG. 5, from ISOTYPE of *S. pulcherrima*.

Var. HALEANA: FIG. 1, TYPE, $\times \frac{2}{5}$; FIG. 2, involucre, $\times 5$, from TYPE.

its var. *argillicola* as separate species, though in his paper he treated them as a single species. In some characters *A. virginica* is the greater departure from *A. neodioica* var. *attenuata* Fernald, Proc. Bost. Soc. Nat. Hist. xxviii. 245 (1898), in having the pistillate involucres "4.5–6.5 mm." high (Stebbins, p. 231), though changed by Stebbins on p. 234 to "5–6.5," whereas his var. *argillicola* was described on p. 232 with them "5.–6.5 mm." high, changed on p. 234 to "5–7." The change of measurements on the two pages seems to reflect the lack of fundamental differences in the two; and, although in his tabulation of characters on p. 234 Stebbins makes the involucres of the almost strictly pistillate and wide-ranging northern *A. neodioica* var. *attenuata* vary from "7–8" mm. high, it is easy to find northern tall plants of var. *attenuata* with them down to 5.5–7 mm., these too much overlapping the upper measurements given by Stebbins for his *A. virginica*. Furthermore, the small rosette-leaves of the bisexual Alleghenian plants are easily matched by those of the unisexual northern series. As a notable variety of Alleghenian range with both sexes well developed it is definite. As a distinct species it shows altogether too much overlapping of characters. Phylogenetically it may be, as Stebbins maintains, the bisexual and fertile progenitor of the widely dispersed northern and parthenogenetic var. *attenuata*. If, however, we are to follow Stebbins's principle and to distinguish as species the bisexual and the parthenogenetic series which show no other appreciable differences, it should be noted that the northeastern *A. Parlinii* and *A. fallax* are chiefly parthenogenetic, though southward frequently bisexual.

VIII. VARIETIES OF GNAPHALIUM OBTUSIFOLIUM

GNAPHALIUM OBTUSIFOLIUM L., var. **praecox**, var. nov. (TAB. 434, FIGS. 1–3), foliis supra glabris lucidisque; panicula elongata cylindracea vel thyrsoides ramis vix furcatis; glomerulis hemisphaericis 1.2–2 cm. diametro; involucris 6–7 mm. altis.—Virginia to Georgia and Alabama. VIRGINIA: without stated locality (presumably near Portsmouth), *Rugel*. SOUTH CAROLINA: sandy roadside by pine woods, 2 miles east of Walterboro, Colleton Co., July 17, 1927, *Wiegand & Manning*, no. 3301 (TYPE in Gray Herb.). GEORGIA: sandy field, 4 miles southwest of Hinesville, Liberty Co., July 23, 1927, *Wiegand & Manning*, no. 3302; dry bank, River Road, Athens, August 5, 1929, *J. H. Pyron*. ALABAMA: dry oak-pine thicket, 10 miles north of Dothan, Houston Co., August 11, 1927, *Wiegand & Manning*, no. 3305.

Var. *praecox*, in its elongate inflorescence and very early flowering

is a striking departure from typical *Gnaphalium obtusifolium* and, when better understood, may prove to be specifically separable. *G. obtusifolium* is highly variable. The typical plant (FIG. 4) has a strongly corymbiform inflorescence, the larger plants with elongate and commonly forking branches; its leaves (FIG. 5) are commonly, though not always, glandular or glandular-papillate above, and, as in var. *praecox* (FIG. 2), its stems and branches are closely white-lanate. In the coastal plain area from York Co., Maine and Cape Cod, Massachusetts to eastern Virginia, and locally in the interior in western New York, Kentucky, Missouri and Michigan, var. *micradenium* Weatherby, RHODORA, xxv. 22 (1923), has the non-tomentose stem (FIG. 6) and the narrow leaves (FIG. 7) minutely glandular-puberulent. From the Cape Charles region to Florida var. *Helleri* (Britton) Blake, RHODORA, xx. 72 (1918), has the stem (FIG. 8) glandular-villous, the leaves (FIG. 9) very broad and thin, and the glomerules rather lax (often with long-pedicelled heads).

Typical *Gnaphalium obtusifolium* is a late-flowering plant. The material in the Gray Herbarium shows the flowering period (heads in anthesis) from southern New England to Florida as follows:

Massachusetts	August 14–November 21
Rhode Island	August 19–October 3
Connecticut	August 23–October 10
New Jersey	August 29–October 5
Pennsylvania	August 22–October 1
Virginia	August 26–October 12
North Carolina	September 4–October 30
Florida	August 2–November 23

Var. *micradenium* is also late-flowering:

Maine	August 29
Massachusetts	August 21–October 7
New Jersey	September 6–October 13
Maryland	September 5–October 2
Virginia	September 9–October 12

The few collections at hand of var. *Helleri* also indicate late-flowering:

Virginia	September 29–October 12
South Carolina	October

Contrasted with this universal late-summer and autumn flowering of most of the varieties of *Gnaphalium obtusifolium*, the material at hand of var. *praecox* clearly indicates a much earlier flowering period.

South Carolina	July 17
Georgia	July 23–August 5
Alabama	August 11

Nevertheless, search for technical characters in flowers and achenes has failed to reveal them. The achenes and the corollas of vars. *Helleri* and *praecox* are minutely larger than in typical *G. obtusifolium* and var. *micradenium*, but the differences are so slight that I cannot yet consider them significant. Further collections and fuller knowledge may show them to be constant.

IX. MINOR FORMS AND TRANSFERS

SARRACENIA PURPUREA L., var. **venosa** (Raf.) comb. nov. *Sarazina venosa* Raf., Aut. Bot. 33 (1840). *S. purpurea venosa* (Raf.) Wherry in *Bartonia*, xv. 3 (1933).

While visiting the Gray Herbarium in January, 1931, Mrs. Agnes M. Ayre, familiar with the typical northern *Sarracenia purpurea* (the national flower of Newfoundland, designated by Queen Victoria), called my attention to the very broad hoods and short pitchers of the southern material as contrasted with the northern specimens of the species. Afterward, knowing his interest in this spectacular group, I called the matter to the attention of Dr. Wherry, and in 1933 in *Bartonia* he clearly differentiated the southern and northern plants. Although preferring the vague trinomial to the clear designation of the category in his formal transfer, Wherry stated in the preceding paragraph that the plants "are here classed as subspecies." For those of us who prefer the Linnean term *varietas* for such geographically segregated but confluent extremes it becomes necessary to re-transfer the name. The term variety, as used by such discriminating recent taxonomists as the late C. E. Moss, the late Otto Holmberg and countless others of the past (Linnaeus, Willdenow, Roemer, DeCandolle, Kunth, Schlechtendal, Hooker, Torrey, Gray and scores of others), is reasonably clear. The term subspecies is used in so many ways as to be vague. I, therefore, consistently use *varietas* when I mean a geographically somewhat segregated extreme.

PTELEA TRIFOLIATA L., forma **pubescens** (Pursh), comb. nov. *P. trifoliata*, β . *pubescens* Pursh, Fl. Am. Sept. i. 107 (1814).

SAXIFRAGA OPPOSITIFOLIA L., forma **albiflora** (Lange), comb. nov. Var. *albiflora* Lange, Consp. Fl. Groenl. 66 (1880). Subsp. *euoppositifolia* Engl. & Irmsch., var. *typica*, subvar. *albiflora* (Lange) Engl. & Irmsch. in Engl. Pflanzenr. iv¹¹⁷. 624 (1919).

For a mere occasional albino, forma *albiflora* seems to have been overweighted with terminology.

HAMAMELIS VIRGINIANA L., forma **parvifolia** (Nutt.), comb. nov.

H. virginica, γ . *parvifolia* Nutt. Gen. i. 107 (1818); *H. virginiana*, β . *parvifolia* (Nutt.) T. & G. Fl. i. 597 (1840).

For discussion see Fernald, RHODORA, xxiii. 265 (1921).

CERCIS CANADENSIS L., forma **glabrifolia**, n. f., foliis utrinque glabris.—Throughout the general range of the typical form of the species, which has the young leaves pubescent beneath, the mature ones somewhat so.—TYPE: wooded hillsides, near Washington, D. C., April 20 and May 15, 1896, *E. S. Steele* (in Gray Herb.).

Cercis canadensis may have the leaves white-pubescent beneath when expanding, only slightly pilose beneath or quite glabrous. There seems to be no geographic segregation of the glabrous extreme. As originally described by Linnaeus *C. canadensis* was assigned "foliis cordatis pubescentibus." The late E. L. Greene made much of this description:

But he who would give to this East North American tree its phytographic deserts, and determine whether it is to be resolved into several varieties or a number of species, must encounter at the outset one grave difficulty, that of the real applicability of the Linnaean name. To the thing which he named *C. Canadensis* he attributed pubescent leaves. Now the great bulk of the material existing in our largest herbaria under that name exhibits foliage that at first and second view impresses one as being glabrous. When you examine the leaf in every part with a magnifier you still find the upper face glabrous, and the lower usually so, in the main, but with some hirtellous hairs along the veins, next the base of the leaf. In only a few instances have I found some scattered hairs between the veins beneath; in a greater number both faces are totally glabrous. Linnaeus writes the leaves of his shrub as pubescent, without qualification. He knew the shrub in young condition both in the garden of Clifort, and in that at Upsala. The seeds were reputed to have come from Canada or Virginia. No cercis with leaves "pubescent," unqualifiedly so and plainly so, is to-day known from eastern America. No American botanist, describing any so-called *C. Canadensis* has ever reiterated, in relation to such "shrub or tree, that phrase of Linnaeus foliis . . . pubescentibus."¹

Approximately half the specimens in the Gray Herbarium have the leaves pubescent beneath and many do not require a lens to disclose the hairs. As to Greene's rhetorical and thoroughly typical statement, "No American botanist, describing any so-called *C. Canadensis* has ever reiterated . . . that phrase of Linnaeus foliis . . . pubescentibus," it is evident that Greene made no attempt to see whether they had! In 1785, Humphrey Marshall (Arb. Amer. 32) distinctly said "a little downy underneath"; Michaux (1803) gave a similar account; Pursh (1814) had *C. canadensis* "foliis . . . ad

¹ Greene in Fedde, Repert. xi. 108 (1912).



Photo. E. C. Ogden

SOLIDAGO RADULA: FIG. 3, involucre, $\times 5$, from Illinois.

Var. *LAETA*: FIG. 4, involucre, $\times 5$, from ISOTYPE; FIG. 5, involucre, $\times 5$, from Texas.

Var. *STENOLEPIS*: FIG. 1, TYPE, $\times \frac{2}{5}$; FIG. 2, involucre, $\times 5$, from TYPE.



Photo. E. C. Ogden

ANTENNARIA MUNDA: FIG. 1, portion of small pistillate plant, $\times 1$, from Vermont; FIG. 2, portion of staminate plant, $\times 1$, from Vermont.

A. FARWELLII: FIG. 3, characteristic basal leaves, $\times 1$, from Michigan.

axillas nervorum villosis" and var. β , *pubescens*, "C. foliis . . . subtus pubescentibus." Passing many later and accurate accounts we come to Sargent's *Silva*, iii. 95 (1892): "leaves . . . glabrous . . . or . . . more or less pubescent below." Enough said!

ERIGERON PULCHELLUS Michx., var. **Brauniae**, n. var., paginis foliorum glaberrimis marginibus ciliatis, foliis rosulatis imisque integris vel undulatis; caule glabro vel sparsissime piloso.—KENTUCKY: sandy open woods, Ohio-Kinniconick Divide, Lewis Co., May 7, 1932, *E. Lucy Braun* (TYPE in Gray Herb.).

The wide-ranging *Erigeron pulchellus* Michx. has the stem and usually the lower surfaces of the radical and lower cauline leaves villous and at least the lower (sometimes the upper) blades coarsely dentate. Professor Braun's plant comes from a region of localized endemics and I find nothing like it in other collections from the Ohio-Kentucky-Tennessee area.

I refrain from displacing the well established *Erigeron pulchellus* Michx. (1803) by a doubtful name of Schoepf (1787). In his *Materia Medica Americana*, David Schoepf published diagnoses (as foot-notes) of several newly described plants. In no case, except possibly the *Erigeron*, did he give any specific epithet to accompany the new diagnosis, merely the generic name: *Asclepias* (p. 30), *Solidago* (p. 123), *Aristolochia* (p. 131). In all cases, except the *Erigeron*, where colloquial names were given they came *after* the specific epithet and the diagnosis, thus:

258. TANACETUM *vulgare* foliis bipinnatis incisiss serratis. Linn. *Sp. pl.* 1184 . . . —Tansey.

In the single exceptional case of the *Erigeron* we get

261. ERIGERON.—*Robert's Plantain. Bethlehemi. Erigeron. Linn. Amoen. acad.* 4. p. 514. LOC. Pennsylvania—*Perennis. PHARM. Erigerontis* Rad. Herba.

and as a foot-note a detailed and very characteristic diagnosis of *E. pulchellus*. The unusual position of the latin *Bethlehemi*, after *Robert's Plantain* and separated by a long dash from the generic name, and Schoepf's modesty, in not assigning any specific epithets to his other newly described species, lead me to conclude that *Bethlehemi* was not intended as a specific name. I am, therefore, not disturbing the familiar and properly published name *E. pulchellus*, the type of which is a very full sheet in the Michaux herbarium.

TANACETUM VULGARE L., forma **crispum** (L.), comb. nov. *T. vulgare*, β . *crispum* L. *Sp. Pl.* 845 (1753).

The common form of Tansy with crisped foliage is a forma rather than a true variety.

EXPLANATION OF PLATES 412-434

PLATE 412. *POTAMOGETON TENNESSEENSIS*, n. sp.: FIG. 1, fruiting top of plant, $\times 1$, from Clear Fork, Tennessee, *Svenson*, no. 6756, TYPE; FIG. 2, branch with submersed foliage, $\times 1$, from the TYPE; FIG. 3, stipule and base of submersed leaf, $\times 10$, from the TYPE; FIG. 4, upper half of submersed leaf, by transmitted light, $\times 10$, from the TYPE; FIG. 5, fruiting spike, $\times 4$, from the TYPE; FIGS. 6 and 7, mature fruits, $\times 10$, from the TYPE.

PLATE 413. *PILEA PUMILA* (L.) Gray, FIGS. 1-9: FIG. 1, leaf-margin, $\times 1$, from Wallingford, Vermont, July 30, 1907, *Kennedy*; FIG. 2, from Dover, Maine, *Fernald*, no. 382; FIG. 3, from Ironside, Quebec, *Victorin*, no. 15,811; FIG. 4, from Abbot, Maine, *Fernald & Long*, no. 13,514; FIG. 5, from Southport, Prince Edward Island, *Fernald & St. John*, no. 7322; FIG. 6, seed, $\times 20$, from Orono, Maine, September 3, 1889, *Fernald*; FIG. 7 (smallest seed seen), from Abbot, Maine, *Fernald & Long*, no. 13,514; FIG. 8, from Westford, Massachusetts, *Emily F. Fletcher*; FIG. 9, from Concord, Massachusetts, September 27, 1896, *Williams*.

Var. *DEAMII* (Lunell) *Fernald*, FIGS. 10-15: fig. 10, leaf-margin, $\times 1$, from Lancaster, Wells Co., Indiana, August 24, 1902, *Deam*, ISOTYPE; FIG. 11, from Lake Everett, Indiana, *Deam*, no. 22,076; FIG. 12, from Garrettsville, Ohio, *Webb*, no. 640; FIG. 13, from Cuthbert, Georgia, *Harper*, no. 1745; FIG. 14, seed, $\times 20$, from Fountain Co., Indiana, *Deam*, no. 22,132A; FIG. 15, from Sandy Creek Township, New York, *Fernald, Wiegand & Eames*, no. 14,258.

P. FONTANA (Lunell) *Rydb.*: FIG. 16, seed, $\times 20$, from Big Chapman Lake, Indiana, *Deam*, no. 21,987.

PLATE 414. *RANUNCULUS FLABELLARIIS* Raf.: FIG. 1, fruiting branch, $\times 5/12$, from Belmont, Massachusetts, *Pease*, no. 11,849; FIG. 2, center of flower, to show stamens, $\times 4$, from Concord, Massachusetts, *St. John*, no. 657; FIG. 3, center of flower, $\times 4$, from Grand Isle Co., Vermont, May 24, 1931, *Knowlton*; FIG. 4, achene, $\times 10$, from Greenwich, Massachusetts, July 13, 1931, *A. S. Goodale*.

R. FLABELLARIIS, forma *RIPARIUS* *Fernald*: FIG. 5, rosette, $\times 5/12$, from Block Island, Rhode Island, *Fernald, Hunnewell & Long*, no. 9511; FIG. 6, emersed branch, $\times 5/12$, from North Guilford, Connecticut, July 13, 1904, *W. R. Dudley*.

PLATE 415. *RANUNCULUS PURSHII* Richardson: FIG. 5, flower, to show stamens, $\times 4$, from Bonaventure River, Quebec, July 31, 1902, *Williams & Fernald*; FIG. 6, achene, $\times 10$, from Dundee, Prince Edward Island, *Fernald, Long & St. John*, no. 7485; FIG. 7, flowering branch, $\times 5/12$, from no. 7485; FIG. 8, flowering branches, $\times 5/12$, from Electric Peak, Montana, *Rydb. & Bessey*, no. 4106.

R. PURSHII, var. *PROLIFICUS* *Fernald*: FIG. 1, type of *R. multifidus*, var. *terrestris* Gray, $\times 5/12$, from Ann Arbor, Michigan, 1862, *Miss Clark*; FIG. 2, flower, $\times 4$, from the latter; FIG. 3, bud, to show sepals, $\times 4$, from the latter; FIG. 4, flower, to show stamens, $\times 4$, from Alpena, Michigan, July 15, 1895, *C. F. Wheeler*.

R. PURSHII, forma *TERRESTRIS* (Ledeb.) Glück: three plants, $\times 5/12$, from Leeds, North Dakota, June 11, 1900, *Lunell*.

PLATE 416. *ARUNCUS*, fruits $\times 7$; flowers $\times 10$; seeds, $\times 10$; leaf-tips, $\times 1$. *A. ALLEGHENIENSIS* *Rydb.*: FIG. 1, fruits (over-ripe) from Baltimore, Maryland, 1867, *P. V. LeRoy* (ISOTYPE); FIG. 2, fruits, showing long styles, from Beaver Creek, Allegheny Co., Pennsylvania, *J. A. Schafer*, no. 639; FIG. 5, flowers, showing the firm calyx, from opposite Georgetown, District of Columbia, May 28, 1889, *Churchill*; FIG. 8, seeds, from near Prince, Monongalia Co., West Virginia, *E. L. Core*, no. 4009.



Photo. E. C. Ogden

GNAPHALIUM OBTUSIFOLIUM: FIG. 4, characteristic inflorescence, $\times \frac{2}{5}$, from New Hampshire; FIG. 5, upper surface of leaf, $\times 10$, from same collection.

Var. PRAECOX: FIG. 1, TYPE, $\times \frac{2}{5}$; FIG. 2, portion of stem, $\times 10$, from TYPE; FIG. 3, upper surface of leaf, $\times 10$, from TYPE.

Var. MICRADENUM: FIG. 6, portion of stem, $\times 10$, from Virginia; FIG. 7, upper surface of leaf, $\times 10$, from same collection.

Var. HELLERI: FIG. 8, portion of stem, $\times 10$, from Virginia; FIG. 9, upper surface of leaf, $\times 10$, from same collection.

A. ALLEGHENIENSIS, var. *PUBESCENS* (Rydb.) Fernald: FIG. 4, fruits, showing slender follicles and long styles, from Augusta, Illinois, *S. B. Mead*.

A. SYLVESTER Kosteletzsky: FIG. 3, fruits, from La Grave, Haute-Alpes, France, *Mathonnet*, no. 1065; FIG. 6, calyx, showing the thin lobes with evident midrib, from near Fiume, Hungary, June 15, 1869, *A. M. Smith*; FIG. 7, seed, from the Carpathian Mts., Austria, *John Ball*; FIG. 9, fruits, from Silverton, Oregon, *J. C. Nelson*, no. 1894 (*A. acuminatus* (Dougl.) Rydb.); FIG. 10, flowers, showing rounded-obovate petals, from near Juvaviam, Salisburgia, *Eysn* in Fl. Exsicc. Austro-Hung., no. 2416; FIG. 11, flowers, showing spatulate petals, from District of Renfrew, Vancouver Island, *Rosendahl & Butters*, no. 66 (*A. acuminatus*); FIG. 12, tip of leaflet, from Asulkan Valley, Glacier, British Columbia, *S. Brown*, no. 601 (*A. acuminatus*); FIG. 13, tip of leaflet from Marienthal, Czechoslovakia, *Petrak*, Fl. Bohem. Morav. Exsicc. no. XI. 1055.

PLATE 417. *SOLIDAGO MULTIRADIATA* Ait.: FIG. 1, plant, $\times 1$, from Rowsell Harbor, Labrador, *Abbe & Odell*, no. 534.

var. *PARVICEPS*, n. var.: FIG. 2, plant, $\times 1$, from "Monts Appalaches," Gaspé Co., Quebec, July 9, 1931, *Stebbins* (TYPE).

PLATE 418. *SOLIDAGO DEAMII*, n. sp.: FIG. 1, plant, $\times 5/12$, from Porter Co., Indiana, *Deam*, no. 39,707 (TYPE); FIG. 2, head, $\times 5$, from TYPE; FIG. 3, disk-floret, $\times 5$, from TYPE.

S. RANDII (Porter) Britton: FIG. 4, head, $\times 5$, from the type-region, Mt. Desert Island, Maine, September 2, 1892, *Edward L. Rand*; FIGS. 5 and 6, florets, $\times 5$, from the same material.

S. RACEMOSA Greene, var. *GILLMANI* (Gray) Fernald: FIG. 7, rosette-leaf, $\times 5/12$, from the original Gillman material.

PLATE 419. *SOLIDAGO SIMULANS*, n. sp.: FIG. 1, plant, $\times 2/3$, from Macon Co., North Carolina, *Biltmore Herb.*, no. 5730; FIG. 2, involucre, $\times 5$; FIG. 3, disk-flower, $\times 5$; FIG. 4, disk-corolla, with 2 lobes laid back, $\times 5$; FIG. 5, achene, $\times 10$; all from the TYPE.

S. ULIGINOSA Nutt.: FIG. 6, involucre, $\times 5$, from Magog, Quebec, *Pease*, no. 1485; FIG. 7, disk-corolla, $\times 5$, from no. 1485; FIG. 8, achene, $\times 10$, from no. 1485.

S. AUSTRINA Small: FIG. 9, involucre, $\times 5$, from Falls of the Yadkin River, North Carolina, August 18, 1892, *Small*.

PLATE 420. *SOLIDAGO CONFERTA* Mill.: FIG. 1, inflorescence, $\times 1$, from the original colored plate in Miller, *Figures of Plants*, ii. t. ccliv. fig. 2 (1760).

S. SPECIOSA Nutt.: FIG. 2, upper half of inflorescence, $\times 1$, from Sheffield, Massachusetts, August 31, 1915, *F. Walters*.

PLATE 421. *SOLIDAGO NEUROLEPIS*, n. sp.: FIG. 1, plant, $\times 2/3$, from Oronogo, Jasper County, Missouri, *E. J. Palmer*, no. 18,863 (TYPE); FIG. 2, lower surface of leaf, $\times 10$, from the TYPE; FIG. 3, involucre, $\times 5$, from the TYPE; FIG. 4, achene, pappus and disk-corolla, $\times 10$, from the TYPE.

PLATE 422. *SOLIDAGO NEUROLEPIS*, n. sp.: FIG. 1, basal rosette, $\times 2/3$, from the TYPE.

S. LUDOVICIANA (Gray) Small: FIG. 2, basal rosette, $\times 2/3$, from northwest of Oyster, Northampton Co., Virginia, *Fernald, Long & Fogg*, no. 5512; FIG. 3, involucre, $\times 5$, from Louisiana, *Hale* (TYPE); FIG. 4, disk-flower, $\times 10$, from Palestine, Anderson County, Texas, *E. J. Palmer*, no. 12,813; FIG. 5, achene and pappus, $\times 10$, from Bennett, Cape May County, New Jersey, *Long*, no. 7945.

S. JUNCEA Ait.: FIG. 6, involucre, $\times 5$, from West Tisbury, Massachusetts, *F. C. Seymour*, no. 1542.

PLATE 423. *SOLIDAGO ELLIOTTII* Torr. & Gray, var. *TYPICA*: plants, $\times 2/3$, from Beaufort District, South Carolina, 1885, *Mellichamp*.

PLATE 424. *SOLIDAGO ELLIOTTII*, var. *ASCENDENS*, n. var.: TYPE, $\times 2/3$, from Harwich, Massachusetts, *M. L., Katherine & H. G. Fernald* in Pl. Exsicc. Gray. no. 492.

PLATE 425. *SOLIDAGO ELLIOTII*, var. *PEDICELLATA*, n. var.: TYPE, $\times \frac{2}{5}$, from Eastville, Virginia, *Fernald & Long*, no. 5520.

PLATE 426. *SOLIDAGO RUGOSA* Mill., var. *TYPICA*: FIG. 1, plant, $\times \frac{2}{5}$, from Esker Point, Groton, Connecticut, September 7, 1903, *C. B. Graves*; FIG. 2, internode and leaf-bases, showing decurrent lines, $\times 5$, from Bingham, Maine, August 29, 1902, *Collins & Chamberlain*; FIG. 3, lower surface of leaf, $\times 10$, from Baddeck, Nova Scotia, *Fernald & Long*, no. 22,702; FIG. 4, involucre, $\times 5$, from no. 22,702.

PLATE 427. *SOLIDAGO RUGOSA* Mill., var. *VILLOSA* (Pursh) *Fernald*: FIG. 1, inflorescence, $\times \frac{2}{5}$, from Rivière du Loup, Quebec, August 3, 1902, *Williams & Fernald*; FIG. 2, inflorescence, $\times \frac{2}{5}$, from Grindstone Island, Magdalen Islands, *Fernald, Long & St. John*, no. 8123; FIG. 3, internode and base of leaf, showing decurrent lines, $\times 5$, from St. John's, Newfoundland, *Fernald, Long, & Dunbar*, no. 27,128; FIG. 4, involucre, $\times 5$, from same plant as FIG. 1.

PLATE 428. *SOLIDAGO RUGOSA* Mill., var. *SPHAGNOPHILA* *Graves*: FIG. 1, plant, $\times \frac{2}{5}$, from Fog Plain Brook, Waterford, Connecticut, August 9, 1903, *Graves* (TYPE-collection); FIG. 2, internode and base of leaf, showing decurrent lines, $\times 5$, from TYPE-collection; FIGS. 3 and 4, involucres, $\times 5$, from TYPE-collection.

PLATE 429. *SOLIDAGO RUGOSA* Mill., var. *ASPERA* (Ait.) *Fernald*: FIG. 1, plant, $\times \frac{2}{5}$, from Chilmark, Massachusetts, *F. C. Seymour*, no. 1362; FIG. 2, internode and leaf-base, showing decurrent lines, $\times 5$, from Franklin, Connecticut, September 1, 1911, *R. W. Woodward*; FIG. 3, lower surface of leaf, $\times 10$, from Sunkipaug, East Lyme, Connecticut, September 16, 1904, *Graves*; FIG. 4, involucre, $\times 5$, from same specimen as FIG. 3.

PLATE 430. *SOLIDAGO RUGOSA* Mill., var. *CELTIDIFOLIA* (Small) *Fernald*: FIG. 1, ISOTYPE of *S. celtidifolia* Small, $\times \frac{2}{5}$, from Biloxi, Mississippi, *Tracy*, no. 5058; FIG. 2, involucre, $\times 5$, from Pulaski Heights, Arkansas, *Demaree*, no. 8181; FIG. 3, involucre, $\times 5$, from ISOTYPE; FIG. 4, involucre $\times 5$, from Capeville, Virginia, *Fernald, Long & Fogg*, no. 5522.

PLATE 431. Habit, $\times \frac{2}{5}$; involucres, $\times 5$. *SOLIDAGO NEMORALIS* Ait.: FIG. 6, involucre, from South Harpswell, Maine, *Greenman*, no. 3502; FIG. 7, from Peters Mountain, Virginia, *Steele & Steele*, no. 275; FIG. 8, from Reading, Pennsylvania, September, 1890, *H. M. Cushman*; FIG. 9, from Ammendale, Maryland, *Hyacinth*, no. 1717; FIG. 10, from Providence, Rhode Island, August, 1844, *Thurber*; FIG. 11, from Hudson Falls, New York, September 25, 1896, *S. H. Burnham*; FIG. 12, from Malpeque, Prince Edward Island, July 26, 1904, *J. Fowler*.

Var. *DECEMFLORA* (DC.) *Fernald*: FIG. 4, involucre from an ISOTYPE, Texas, *Berlandier*, no. 1924; FIG. 3, from ISOTYPE of *S. longipetiolata* *Mackenzie & Bush*, Jackson Co., Missouri, August 19, 1897, *Mackenzie*; FIG. 5, from ISOTYPE of *S. pulcherrima* *Nelson*, Platte Canon, Wyoming, *Nelson*, no. 2761.

Var. *HALEANA*, n. var.: FIG. 1, TYPE from Louisiana, *Joshua Hale*; FIG. 2, involucre from TYPE.

PLATE 432. Habit $\times \frac{2}{5}$; involucres, $\times 5$. *SOLIDAGO RADULA* Nutt.: FIG. 3, involucre from Grand Tower, Illinois, *Gleason*, no. 1844.

Var. *LAETA* (Greene) *Fernald*: FIG. 4, involucre from ISOTYPE of *S. laeta* *Greene*, from Weatherford, Texas, *Tracy*, no. 8137; FIG. 5, involucre of extreme plant, from Boot Springs, Chisos Mts., Texas, *Cory*, no. 7238.

Var. *STENOLEPIS*, n. var.: FIG. 1, TYPE, from near Carthage, Jasper Co., Missouri, *E. J. Palmer*, no. 22,161; FIG. 2, involucre from TYPE.

PLATE 433. *ANTENNARIA MUNDA*, n. sp.: FIG. 1, portion of small pistillate plant, $\times 1$, from Middlebury, Vermont, May 16, 1899, *Brainerd*, no. 29; FIG. 2, portion of staminate plant, $\times 1$, from Middlebury, Vermont, May 10, 1902, *Brainerd*.

A. FARWELLII *Greene*: FIG. 3, characteristic basal leaves, $\times 1$, from Keweenaw Co., Michigan, *Farwell*, no. 78.

PLATE 434. *GNAPHALIUM OBTUSIFOLIUM* L. FIG. 4, characteristic inflorescence, $\times \frac{2}{5}$, from East Jaffrey, New Hampshire, September 2, 1901, *E. F. Williams*; FIG. 5, upper surface of leaf, $\times 10$, from the same collection.

Var. *PRAECOX*, n. var.: FIG. 1, type, $\times \frac{2}{5}$, from Waterboro, South Carolina, *Wiegand & Manning*, no. 3301; FIG. 2, portion of stem, $\times 10$, from the TYPE; FIG. 3, upper surface of leaf, $\times 10$, from the TYPE.

Var. *MICRADENIUM* Weatherby: FIG. 6, portion of stem, $\times 10$, from Williamsburg, Virginia, *Grimes*, no. 4351; FIG. 7, upper surface of leaf, $\times 10$, from same collection.

Var. *HELLERI* (Britton) Blake: FIG. 8, portion of stem, $\times 10$, from Eastville, Virginia, *Fernald & Long*, no. 5550; FIG. 9, upper surface of leaf, $\times 10$, from same collection.

FURTHER NOTES ON OKLAHOMA PLANTS

GEORGE J. GOODMAN

SOME plants not heretofore listed from Oklahoma, so far as the writer knows, are commented on below. All the specimens are in the Herbarium of the University of Oklahoma and the Goodman plants are usually to be found in the larger herbaria of this country as well.

JUNIPERUS MONOSPERMA Sarg. f. *GYMNOCARPA* (Lemmon) Rehder. Dry hills, 5 miles east of Kenton, Cimarron Co., April 21, 1935, *Goodman*, No. 2409.

BOUTELOUA ERIPODA (Torr.) Torr. Dry soil, 3 miles east of Kenton, Cimarron Co., Aug. 27, 1934, *Goodman*, No. 2293.

The known ranges of this grama and of the partially naked-seeded juniper are thus extended eastward and into a new state.

LESQUERELLA OVALIFOLIA Rydb. var. *alba*, var. nov., speciei similis, sed floribus albis.—Hilltop, Arbuckle Mts., Murray Co., OKLAHOMA, April 7, 1934, *Goodman*, No. 2077, TYPE (Herb. Univ. Okla.).

The white-flowered phase is accorded varietal rank because of its distinct geographic distribution. It has been found only in limestone soil at the southeast portion of the distributional area of the species.

Other specimens definitely referable to this variety are: open place, Arbuckle Mts., April 23, 1927, *Lois Gould*; upland, Arbuckle Mts., April 13, 1929, *Lois Gould*; rocky ground, Birds Mill, 15 miles south of Ada, Pontotoc Co., April 21, 1935, *Lila Middleton*.

Very probably some of the Oklahoma specimens cited by Payson¹ under *L. ovalifolia* in his excellent monograph of the genus belong to this variety, but even when the pressed specimens are in flower the original color of the corolla is often lost.

DALEA FRUTESCENS Gray. Near Prices Falls, Arbuckle Mts., Oct. 6, 1935, *Mrs. H. M. Hamilton*.

¹ Payson, E. B., Monogr. Genus *Lesquerella*, Ann. Mo. Bot. Gard. 8: p. 154. 1921.

This very interesting find further adds to the list of plants in the Arbuckle Mts. which are to be found elsewhere on (and frequently only on) the limestone plateaus of central and southern Texas.¹ The known range of this shrubby and handsome *Dalca* is thus extended a great distance to the northward.

PHACELIA CONGESTA Hook. Foothills of Wichita Mts., Comanche Co., July 3, 1903, *A. H. VanVleet* No. 109.

The writer finds no evidence of this Texas plant having been found so far north.

HEDEOMA CAMPORUM Rydb. This pennyroyal, which is fairly common in the western half of Oklahoma, is given a range of "N.D.—Kans." in Rydberg's *Flora of the Prairies and Plains*. This is probably due to an oversight, as there are several specimens of this species in the widely distributed Stevens collections. Other collections are: Caddo Co., June 27, 1903, *Kline*; Weatherford, Custer Co., June 29, 1920, *Jeffs*; steep sides of prairie ravine, McClain Co., June 17, 1934, *Goodman*, No. 2144.

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MOSS FLORA OF NORTH AMERICA.—Since the writer's review of volume 2, part 1 and volume 3 of this work, in the June 1935 issue of *Rhodora*, two further installments of volume 2 have been issued.² Part 2 takes up the following families: *Ephemeraceae*, *Disceiaceae*, *Funariaceae*, *Splachnaceae*, *Schistostegaceae*, *Erpodiaceae*, and *Orthotrichaceae* (in part); part 3 completes the *Orthotrichaceae* and covers the *Timmiaceae*, *Aulacomniaceae*, *Bartramiaceae*, *Meesiaceae*, and *Bryaceae* (in part). The treatment of the *Erpodiaceae* is by Dr. W. C. Steere, of the *Splachnaceae*, *Timmiaceae* and *Aulacomniaceae* by Miss Geneva Sayre, of the *Bartramiaceae* by Dr. Seville Flowers and of the *Bryaceae* by Dr. A. Le Roy Andrews. The following new species are described *Entosthodon bartramii* Grout, *Uloa funstoni* Grout, *Orthotrichum garrettii* Grout & Flowers, *Anacolia aristifolia* Flowers, *Bartramidula carolinae* Sharp, together with eight new varieties and sixteen new forms. Thirteen species-combinations are here named for the first time plus about twenty-five variety- and form-combinations. Additional parts are expected to appear in the near future.—G. E. NICHOLS.

¹ Cf. Palmer, E. J., *Jour. Arn. Arb.* 15: 127-134. 1934.

² Moss flora of North America, north of Mexico, by A. J. Grout. Vol. 2, part 2, pp. 67-138, pls. 26-57, May 1935, and part 3, pp. 139-210, pls. 58-83, December, 1935.

Volume 38, no. 449, including pages 165-196 and plates 412-416, was issued 2 May, 1936.

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